The Communicator

July - August 2026

The Bi-monthly Journal of Surrey Amateur Radio Communications

50 years of expertise bridging RF passion with essential public safety response

Surrey Amateur Radio Communications

QSK?

-.-- ... -.-

...from the Editor's Shack

PUBLICATION CONTACTS

THE COMMUNICATOR

Editor John Schouten VE7TI
communicator@ve7sar.net

CONTRIBUTING EDITORS

John Brodie VA7XB
Kevin McQuiggin VE7ZD/KN7Q

The Communicator is a free electronic periodical published by Surrey Amateur Radio Communications in Surrey, B.C., Canada. All rights are reserved.

Our article reprint policy is on page 113

Issues appear bi-monthly, on odd-numbered months, for area Amateur Radio operators and beyond, to enhance the exchange of information and to promote amateur radio activity.

Submissions of articles and photos are welcome.

During non-publication months we encourage you to visit the Digital Communicator at ve7sar.blogspot.ca, which includes recent news, past issues of The Communicator, our history, photos, videos and other information.

To subscribe, unsubscribe or change your address for e-mail delivery of this electronic journal, notify communicator@ve7sar.net

If you find The Communicator worthwhile, regular readers who are not SARC members are invited to join our club or contribute a donation towards our Field Day fund via PayPal or via eTransfer to payments@ve7sar.net

SARC maintains a website at www.ve7sar.net

I have to start this edition with an apology… We're moving house after 47 years. It is with a great deal of trepidation but the time has come. My wife has forbidden me to climb up on the roof for regular maintenace and the yard and landscaping is getting too large for us to maintain as we used to.

The worst thing is that I have to give up my home HF station, tower, HF Yagi, Carolina Windom and all. Of course there is still POTA and there will be an attempt to install a stealth HF station.

What this means for our readers is that the next issue of The Communicator may not be as complete or lengthy as normal. For this issue it is take-down and packing and, in time for the next it will be unpacking and a slew of interior fix-ups at the new place including painting and flooring.

But, thanks to our regular contributors and guest authors I think that we have pulled together an enjoyable read for this issue despite these challenges.

We welcome back Daniel Romila VE7LCG. Daniel was a regular Communicator contributor but he decided to take a break from writing. He is back and we have two of his articles in this issue with more to follow.

Enjoy this issue, and please keep the comments and suggestions coming — communicator@ve7sar.net.

~ John VE7TI, Editor

Don't miss our Field Day photos

IN THIS ISSUE

Nicolaas Kooman - Single-Sideband Pioneer	4	Automating the Yaesu FH-2 with an Arduino NANO	71
Trials and Errors - Bringing Down the Duke	8	Modulated light: An Experiment in Communications	75
A SARC/SEPAR Field Day Summary	12	Outside the box: What to do when the bands suck?	76
The Lighter Side of Amateur Radio	13	VPD Amateur Radio Group	79
Radio Ramblings - The Grab Bag	16	Zero Retries	80
The RMS Field Gateway v1.0	28	Foundations of Amateur Radio: What does amateur radio bring to	
Building Precision Timekeeping: The NTP Dual Clock	32	your life?	86
An An Alternative NTP Dual Clock	35	Our RF Communications High School Semester Course	88
Tips For Searching the Communicator's Online Index	40	The Secret Lagercrantz Suitcase Radio	93
Hamilton Radio Programmer	43	Andy's Ham Radio Linux: A laptop or Pi to support your station on	
iCOM 7300, 7610, 9700 Special Interest Group	44	the air	94
A True RMS to DC Converter for your DVM	48	No-ham Recipes: Taco Salad	95
A review of Amateur Radio operations at the ISS	50	Profiles of SARC members: Bill Dorfmann VE7WDO	98
Amateur Radio Goes Hollywood (…ish):	52	SARC General Meeting minutes May 13, 2026	102
Wider Sideband SSB?	56	SARC 2026 Annual General Meeting minutes June 10, 2026	105
Reviving Teletext for Ham Radio	58	SARC General Meeting minutes June 10, 2026	108
Pico balloon VE7NFR-15	59	FD 2026 Two perspectives	114
Johan Heijboer: 'Warm Electronics'	62	Has Ham Radio Lost Its Soul VK9DX had some thoughts…	
Spy Tech: A Quiet Radio For Spies	64	so have I	116
Using a Quansheng? Don't Brick Your UV-K5!	65	HAM LEFTOVERS...	119
FT8 Automation With the MSHV Program	66	A look back at The Communicator—June 2016	120

Do you have an article photo or bit of Ham news to share? An Interesting story or link? Something you are looking for?
eMail it to communicator@ve7sar.net for inclusion in this publication.

The
Communicator
July - August 2026
The Bi-monthly Journal of Surrey Amateur Radio Communications
50 years of expertise bridging RF passion with essential public safety response

This Month's Cover…

Our annual SARC Fox Hunt took place in May. Two first place winners, Michaela, granddaughter of Les VA7OM and Team Schouten with Mya (age 11), Martin VA7MOB and John VE7TI.

This was Michaela's first fox hunt and Mya has been ARDF-ing since age 5.

Keep your face to the sunshine and you cannot see a shadow.
– *Helen Keller*

The Rest of the Story...

Nicolaas Koomans

Single-Sideband Pioneer

Nicolaas Koomans
1879–1945

The field of amateur radio is filled with pioneers who started as curious hobbyists and ended up reshaping global communications, and few embody this spirit better than Nicolaas Koomans. His passion for radio experimentation, starting from his earliest days as a "radio amateur of the first hour," would propel him to the highest echelons of Dutch engineering, culminating in the first intercontinental multi-channel SSB link—a true milestone for our craft. To celebrate the great achievements of those who came before us, let's look at the life and legacy of a man who was truly a "technician to the core" and for whom radio technology was his "lust and life".

Early Life and Education

Nicolaas Koomans was born in Delft on December 18, 1879, and his formative years were thoroughly grounded in the technical excellence the city is known for. He attended the Hogere Burgerschool (HBS) from 1892 to 1897 before enrolling at the Polytechnic School in Delft from 1897 to 1901, the institution that would later become the Delft University of Technology.

Interestingly, at the time, electrical engineering could only be studied as a minor subject because a separate faculty for it did not yet exist, so Koomans studied mechanical engineering instead. After graduating, he spent two years as an assistant in applied physics and electrical engineering under Professor J. Snijders, a period that sharpened his hands-on expertise before he entered government service.

Entry into Professional Radio

In 1903, Koomans joined the Dutch State Telegraph and Telephone Service as an aspirant engineer, marking the beginning of a career that would soon put him at the forefront of international radio engineering.

While working, he pursued his doctorate, completing a PhD in 1908 with a thesis titled Over den invloed der zelfinductie in telefoongeleidingen ("On the Influence of Self-Induction in Telephone Lines") under Professor C.L. van der Bilt—a classic example of how early radio and telephony engineering were deeply intertwined.

Koomans' first major professional milestone came in 1912, when he was appointed Chief of the Telegraph Repair Workshop in The Hague. It was there, beginning in 1917, that he conducted his first large-scale experiments in the radio field.

In 1919, he was given leadership of the newly established Bureau Proefnemingen, Onderzoek en Onderwijs (Bureau for Experiments, Research and Education), and by 1925, this bureau evolved into the Radio Laboratory of the State Telegraph Agency, with Koomans as its Chief.

Later, in 1934, he was also appointed an extraordinary professor of electrical engineering at the Technical University of Delft.

The "Radio Amateur of the First Hour"

Despite his demanding professional duties, Koomans never forgot his roots in amateur experimentation. In 1916, he was a founding member of the Dutch Association for Radio Telegraphy (NVVR) and immediately joined its board—at a time when the organization was essentially a club for dedicated hobbyists exploring this new medium.

Throughout the late 1910s and 1920s, he gave countless lectures and demonstrations for the association and published numerous technical articles in its organ, Radio Nieuws.

The "Schema van Koomans"

This commitment to helping fellow enthusiasts is best exemplified by his most famous contribution to amateur radio: the "Schema van Koomans" (Koomans Circuit). It was a three-valve (three-tube) TRF receiver built according to the 1V1 principle, which was one stage of high-frequency (RF) amplification, a detector stage with regeneration, and one stage of low-frequency (audio) amplification.

Due to the very limited strength of early signals, the inclusion of RF amplification allowed amateurs to use physically smaller antennas and greatly increased the receiving range. However, adding RF amplification to a home-built receiver was no small challenge. Instability—often manifesting as the HF stage breaking into oscillation and producing a loud, interfering howl—was a serious problem that earned the unwanted effect the nickname "Mexicaanse Hond" (Mexican Dog) in Dutch amateur circles.

Koomans' design addressed this with a clever solution. As a 1926 article describing the circuit explained: "A main requirement with this kind of

receiver with RF amplification, is to keep the primary coil completely outside the coupling area, flat against the front plate, and to make the wire connections to the coil holders so that a counter-acting coupling is created, as soon as one slightly couples the primary coil with the secondary coil. By doing so, one can counteract the tendency to generate, without loss of volume".

The result was a relatively stable, easy-to-build receiver at a time when many circuits were beyond the average amateur's skill. The "Schema van Koomans" became wildly popular, and a large portion of the early Dutch amateur receivers was based on this design. It was eventually expanded into a four-valve version, and the layout—often housed in a beautifully crafted oak lectern-style cabinet with visible honeycomb coils on the outside—remains an iconic piece of Dutch radio history.

The SSB Pioneer: Bridging the Dutch East Indies

Koomans' professional engineering work, however, would leave an even more profound mark on the history of radio. In the 1920s, the Dutch government faced a monumental challenge: establishing reliable, high-quality radio communication with the Dutch East Indies (modern-day Indonesia), located more than 12, 000 kilometers away.

Koomans was centrally involved in this effort from the start, and his team pioneered breakthroughs in shortwave antenna design and long-distance transmission that made the Dutch link one of the most advanced in the world. In 1925, Dr. Koomans installed an extremely simple single-stage shortwave transmitter at Radio Kootwijk, the massive transmission facility in the Veluwe region of the Netherlands. With only a few kilowatts of power, a stable connection was established, and its telegram traffic quickly surpassed that of the older long-wave transmitter, largely because shortwave allowed for much higher data speeds.

Asymmetric-Sideband

But Koomans was not satisfied with simply making the link work. Throughout the 1930s, he foresaw a problem that remains urgent to this day: the limited capacity of the radio spectrum. To solve this, he developed a transmission system that would today be recognized as a form of multi-channel SSB.

He published his findings in the Proceedings of the Institute of Radio Engineers (the IRE was the direct forerunner of today's IEEE) in 1938 and 1939, with papers on "Single-Side-Band Telephony Applied to the Radio-Link between the Netherlands and the Netherlands East Indies" and "Asymmetric-sideband broadcasting".

Koomans' approach was to develop an "asymmetric-sideband" (sometimes called "compatible SSB") system that transmitted a full carrier and one full sideband, while only transmitting the lower audio frequencies of the other sideband. This innovative technique found a practical balance between inefficient standard double-sideband AM and the more complex pure SSB systems that would come later. It conserved valuable bandwidth and improved power efficiency, helping to maximize the limited capacity of the transoceanic radio link.

When fully implemented, this system became the first shortwave intercontinental multi-channel SSB link in history, revolutionizing the Dutch East Indies connection at Radio Kootwijk by making it far more stable and reliable than any other such link in the world at the time.

It is ironic that Kooman is rarely mentioned for his ground-breaking SSB development. The first U.S. patent application for SSB modulation was filed on December 1, 1915, by John Renshaw Carson. The U.S. Navy experimented with SSB over its radio circuits before World War I. SSB first entered commercial service on January 7, 1927, on the longwave transatlantic public radiotelephone circuit between New York and London. The high power SSB transmitters were located at Rocky Point, New York, and Rugby, England. The receivers were in very quiet locations in Houlton, Maine, and Cupar, Scotland.

SSB was also used over in carrier telephony over long-distance telephone lines, using a technique known as frequency-division multiplexing (FDM). FDM was pioneered by telephone companies in the 1930s. With this technology, many simultaneous voice channels could be transmitted on a single physical circuit, for example in L-carrier. With SSB, channels could be spaced (usually) only 4,000 Hz apart, while offering a speech bandwidth of nominally 300 Hz to 3,400 Hz.

Amateur radio operators began serious experimentation with SSB after World War II. The Strategic Air Command established SSB as the radio standard for its aircraft in 1957. It has become a de facto standard for long-distance voice radio transmissions since then.

Legacy and Final Years

Throughout his career, Koomans' impact extended well beyond his own country. He was a board member of the Netherlands Radio Society (NRG) and the Bond van Octrooihouders (Association of Patent Holders), and he also served as a radio technical advisor to the League of Nations.

His leadership was instrumental in building what we now recognize as the infrastructure of global shortwave radio, and the facilities he helped design at Radio Kootwijk remained operational for decades.

However, his final years were controversial. During the German occupation of the Netherlands in World War II, Koomans was subject to criticism over his "Duitsgezindheid" (German sympathies), which arose from a longstanding admiration for the pioneering German radio engineers of his youth. But it is important to note that, as a historical record summarizes, "His personal preference never caused harm to others".

Nicolaas Koomans died in The Hague on October 4, 1945, barely a month after the end of the war in Europe. Despite the stain of controversy in his final years, the sheer scale of his technical achievements remains undeniable. He is remembered as one of the most important radio pioneers the Netherlands has ever produced, a man who built with his own hands the circuits that let his amateur compatriots hear the world, and who then, as chief of the Radio Laboratory, built the systems that let the world talk across the oceans.

An Enduring Influence

For us today, Nicolaas Koomans is a towering figure who truly bridged the worlds of passionate amateur experimentation and rigorous professional engineering. He gave us the practical, stable, home-built receiver circuits that helped shape our hobby in its earliest years—the classic "Koomansontvanger" remains a favorite project for vintage radio enthusiasts.

More than that, his groundbreaking research into spectrum-efficient transmission directly paved the way for the modern SSB modes we use on our HF bands every day. His work on asymmetric-sideband broadcasting, published in the IRE Proceedings, contributed to the foundational knowledge that would lead to widespread SSB adoption in the amateur service in the decades to follow.

When we spin the dials on our modern transceivers, make a contact on 20-meter SSB, or marvel at the reliability of long-distance HF links, we are hearing the echoes of Koomans' innovations from nearly a century ago. He was a radio amateur of the first hour who never stopped building, experimenting, and reaching further, and his legacy continues to inspire us to do the same.

~ Compiled from various sources

Trials and Errors

Bringing Down the Duke

by DAVE JENSEN W7DGJ

Dave Jensen, W7DGJ, was first licensed in 1966. Originally WN7VDY (and later WA7VDY), Dave operated on 40 and 80 meter CW with a shack that consisted primarily of Heathkit equipment. He has published articles in magazines dealing with science and engineering.

In the early stages of WW II in Europe, Germany had begun to think about America and that country's future potential as an antagonist. While neutral at the time, it was clear that if America entered the war, it would be on the side of the Allies. And so, as nations have always done, Germany began to place a network of spies on their prospective enemy's turf. Central to this plan would be radio, along with a network of operators who would participate in the German plans. German technology had produced high-quality HF radio designs in very small sizes for such operations, but the Germans were limited by the fact that most spies did not know Morse code.

The man whom Germany chose to manage this complicated web of deceit was Fritz Duquesne (photo at left) who later became known as "The Duke" to American law enforcement.

Catching the Duke and his crew proved to be quite an effort. While he worked with a number of not-so-sharp individuals further down his network, Duquesne himself was a special kind of operator -- a real "dark side" James Bond predecessor. Naturalized as a US citizen in 1913, Duquesne first became a spy for Germany in WWI. During that war he was captured five times and managed to escape from his captors each time . . . three times from the British, once from the Portuguese, and once from the Americans! No one appeared able to hold this slippery character who was vehemently anti-British.

During that first war he smuggled bombs on board British ships in South America and sank a number of them, including the HMS Hampshire in 1918, taking out an important British statesman. This "Duke" was greatly valued by the Abwehr, the

German intelligence service who awarded him the rank of Colonel. (Photo of the Duke in his German uniform below.)

His story gets even more interesting when you read about his exploits between wars. The Duke was an adviser on big-game hunting to US President Theodore Roosevelt, he published as a journalist, became a fake Australian war hero for a time, and even worked as a publicist in the Hollywood movie business. Amazing.

Building Plans to Infiltrate America

It was in 1937 when the German plans began to bear fruit. From the German Abwehr headquarters, Admiral Nikolaus Ritter was assigned the North American spy effort. Ritter had emigrated to the USA in 1924 to improve his American English skills. He married an American woman and moved back to Germany, rising up the ranks into a senior role in the intelligence services. With his knowledge of America and his language skills, he was an obvious choice to manage the developing spy network. Apparently, the first thing he thought about with that new assignment was how to establish a radio network that could be used to get vital secrets across the Atlantic to Germany. That information would include secrets on American defenses, ships and their movement across the Atlantic to England, industrial designs and so forth.

His team recruited a German-American by the name of William Sebold who would work with the Duke in an office in New York under an assumed name. The two would build an HF radio station on Long Island to keep the flow of information going into Germany.

Sebold valued his naturalized US citizenship, however. He secretly approached the American Consulate in Cologne, Germany during his training to let them know he'd be willing to assist the FBI as an undercover agent, an offer that immediately proved valuable. This "double agent" then became an important player in the USA effort to rein in and capture this entire network of German spies in the States.

The German Organization in America Grows Larger

Fritz Duquesne had already established quite a downstream network by the time that he met Sebold and together set up that HF station on Long Island. One of those was Felix Jahnke, a ham and another naturalized American citizen. Formerly a radio operator out of Germany, he knew his high-speed CW but was (as many today) not cockpit qualified to build a radio by himself. For that effort, Jahnke found another willing ham, Mr. Josef Klein, who jumped into the network with enthusiasm due to his hands-on love of electronics. He built a station from scratch that outfitted Jahnke's New York apartment. (No pictures survive of that radio, left is a photo created by AI using "museum quality" information. Opinions welcome.) It's unclear whether Klein knew of the end-use of this apparatus or not, but he was eventually imprisoned for his efforts.

Another was Paul Scholz, a ham later arrested for providing another of Duquesne's colleagues with a chart of suggested call letters and frequencies for reaching Germany by CW with that 20-watt rig in the Bronx. This part of the Duke's crew was seen spending time in harbors identifying ships and cargo headed to England.

But it wasn't only hard information that the Nazis were interested in from amateur radio operators. In the late 1930's and early 1940's, Germany recruited primarily through German communities in the States, hoping they could use amateur radio enthusiasts to transmit Nazi propaganda as well. That effort had little success as most hams focused on technical rather than political exchanges (as we do today).

The Hammer Drops on The Duke and His Team

The German spy ring's downfall actually began when the double agent, William Sebold, came from Germany and set up shop in New York. The radio station built out on Long Island for Sebold

and Duquesne's team was monitored 24/7 by FBI agents operating under the instructions of J. Edgar Hoover. Over a short period of time the FBI noted the contents of more than 300 exchanges between Germany and America, ensuring that every one of the operators bringing information to the table for Germany would have enough evidence against them for a conviction. Even the Duke's live-in girlfriend, Evelyn Lewis, was closely watched by the FBI. She had been aware of all of Duquesne's clandestine activities and was herself known to distribute anti-British and anti-Semitic materials.

Within a week or two after the start of the war in the USA (December, 1941) all members of the Duquesne spy ring had been rounded up and sentenced. The FBI bust in this case proved to be the single largest arrest of counterintelligence agents in the United States, and a major coup for J. Edgar Hoover and his team. The 33 convicted members of the ring served over 300 years in prison. The Duke himself served 14 years before he was released for poor health reasons, passing on in 1956. He died in poverty and is buried in a Potter's Field.

(See the Interesting overview of German spy radios at this link. Another interesting document is the entire FBI detail from circa 1941, at this link on the FBI website.)

~ Dave, W7DGJ

https://www.qrz.com/articles/node_1774647395

Dave Jensen, W7DGJ, was first licensed in 1966. Originally WN7VDY (and later WA7VDY), Dave operated on 40 and 80 meter CW with a shack that consisted primarily of Heathkit equipment. Dave loved radio so much he went off to college to study broadcasting and came out with a BS in Communications from Ohio University (Athens, OH). He worked his way through a number of audio electronics companies after graduation, including the professional microphone business for Audio-Technica. He was later licensed as W7DGJ out of Scottsdale, Arizona, where he ran an executive recruitment practice (CareerTrax Inc.) for several decades. Jensen has published articles in magazines dealing with science and engineering. His column "Tooling Up" ran for 20 years in the website of the leading science journal, SCIENCE, and his column called "Managing Your Career" continues to be a popular read each month for the Pharmaceutical and Household Products industries in two journals published by Rodman Publishing.

A SARC/SEPAR 2026 Field Day Summary in Photos

We received a very nice write-up of the event in the Cloverdale Reporter: https://cloverdalereporter.com/2026/06/27/surreys-ham-operators-put-their-emergency-communication-skills-to-the-test/

See the SEPAR Field Day report on page 116

Page 12

News You Can’t Lose

Thanks to everyone who has been on the air as VB7F so far and there is still time to participate.

The response from the global amateur radio community has been fantastic! To give you an idea of the stats so far, the overall 16 host city QSO count is over 77,000 and includes 172 different countries worked. Here in BC the Vancouver Host City VB7F SES operators have contacted over 11,000 amateurs in over 100 countries! Great job to those who have been on the air to support this event!

Feel free to encourage your Ham Radio friends to get involved and support VB7F. It's easy to register for use of the call and to book a time slot to operate by going to www.vb7f.ca.

As a gentle reminder, don't forget to configure your Grid Square in your logging program.

Looking forward to seeing you on the air!

73,

~ Neil King VA7DX

For the VB7F team

Special event website https://wc2026ses.org

	160M	80M	60M	40M	30M	20M	17M	15M	12M	10M	6M	2M
CW		51	7	813	95	4314	160	948		1		
PH	3	25		1253	1	6651	132	99	1	626		59
DIG	13	288	71	3100	4174	11382	4870	3664	261	183	567	

Page13—News You Can Lose

The Lighter Side of Amateur Radio

The Montgomery Ward Gasoline-Powered Amateur Radio Transceiver:

Sparks, Soot, and the Roar of the Aether

In the roaring 1920s, when flappers danced the Charleston and Model T Fords rattled down dusty roads, the amateur radio enthusiast faced a peculiar dilemma. Electricity was still a fickle city luxury, and rural hams—those brave souls with wire antennas strung between barn silos and oak trees—yearned for a way to hurl their voices across the continent without relying on temperamental batteries or hand-cranked generators. Enter Montgomery Ward, the great catalog purveyor of everything from corsets to cream separators, with a marvel that promised to solve all problems: the "*Quick-Lite" Gasoline-Powered Amateur Radio Transceiver, Model GW-1927*.

Yes, dear reader, you read that right. Just like their clothes iron, a radio set that ran on gasoline. Or, more precisely, on LSR—Light Straight Run naphtha, the same volatile brew sold as "white gas" for camp stoves and the occasional optimistic attempt to clean your Sunday suit. Montgomery Ward didn't invent the concept; they simply did what they did best: take a dangerous idea, dress it up in a handsome oak cabinet with brass fittings, print a glowing description in their catalog, and ship it to every farmhouse from Maine to California. "*No more dead batteries mid-QSO!*" the ad trumpeted. "*Communicate with fellow amateurs in Chicago, Denver, or even the daring DX stations in Hawaii while your wife irons the curtains with our matching gasoline iron!*"

The set itself was a marvel of early 20th-century over-engineering. A sturdy wooden cabinet, roughly the size of a large phonograph, housed a regenerative receiver on one side and a simple transmitter on the other. But the heart—and the lungs, and the occasional fireball—of the beast was the integrated "Thermo-Dyne" power unit. This was essentially a miniature gasoline engine coupled to a dynamo, with a generous fuel tank that doubled as a footrest for the operator during long ragchews. Why settle for dry cells when you could have the reliable thump of internal combustion?

To operate this wonder, the aspiring 1920s ham followed a ritual that would make modern FCC inspectors faint dead away. First, you topped off the tank with fresh naphtha, careful not to spill any near the glowing tubes or the antenna lead-in. A few vigorous pumps on the built-in primer plunger built pressure in the tank—much like the gasoline iron's priming system, but with higher stakes. Then came the fun part: striking a match and applying it to the starting burner through a small access door while gently cracking the fuel valve. If the stars aligned (and the wind wasn't blowing toward the barn), a cheerful blue flame would roar to life beneath the vaporizing coil. Within minutes, the Thermo-Dyne would be chugging away, its little piston slapping merrily, driving the dynamo that produced a glorious 6 volts at several amperes—

more than enough to light up your 201A tube like a Christmas tree and put a respectable signal on 40 meters.

The manual, a marvel of cheerful understatement printed in fading sepia ink, warned: "*Under no circumstances should the operator attempt to refuel while the set is in operation. Also, avoid proximity to open flames, small children, livestock, and dry hay.*" One suspects the Montgomery Ward lawyers had worked overtime on that one after early field reports trickled in.

Our hero in this tale is none other than Ezekiel "Zeke" Hargrove of rural Iowa, a lanky farmer with a love for Morse code and a healthy disregard for personal safety. Zeke had ordered the GW-1927 after reading glowing testimonials in QST magazine. "*Worked W1AW with 5 watts input while plowing the south forty!*" claimed one satisfied customer. Never mind that the testimonial was probably written by a Ward copywriter who had never touched a key in his life.

Zeke's first attempt to fire up the rig is the stuff of amateur radio legend. It was a crisp autumn evening in 1928. The family had gathered around after supper—Ma with her knitting, the kids wide-eyed with anticipation, and old Blue the hound wisely hiding under the porch. Zeke, wearing his best celluloid collar and a pair of asbestos gloves he'd ordered special from the catalog, poured in the naphtha, primed the system, adjusted the nebulizer, and struck the match.

The burner caught with a satisfying whoosh. The Thermo-Dyne began its distinctive putt-putt-putt, and soon the filaments of the tubes glowed a healthy orange. Zeke threw the antenna switch, tuned the regenerative receiver with trembling hands, and was rewarded with the sweet sounds of distant CW stations drifting through the ether. "*CQ CQ CQ de 9ZKH*," he tapped out on the shiny brass key. To his delight, a strong signal came back from a fellow ham in Minnesota. They chatted about crop prices, the new Radiola models, and whether Lindbergh's flight had been a fluke.

All was well until about twenty minutes in, when Zeke noticed a peculiar smell. Not the usual hot transformer and ozone aroma of a proper rig, but something sharper. Something like… burning insulation mixed with regret. The exhaust from the little engine, cleverly vented through a pipe that doubled as a chimney for the cabinet, had been quietly depositing soot and unburned hydrocarbons onto the tuning capacitors. Worse, a small leak in the fuel line had formed a puddle beneath the set. The heat from the vaporizer was doing what heat does best around naphtha.

"*Zeke, dear, is that smoke?*" Ma asked mildly.

Before he could answer, the regenerative receiver began to howl with feedback as the increasing temperature detuned everything. Zeke frantically adjusted the tickler coil, but it was too late. A small blue flame licked up from under the cabinet. Blue the hound began to howl in solidarity. The children cheered, thinking it was part of the show. Zeke, displaying the quick thinking that had kept him alive through several previous radio experiments, grabbed the nearest container—a pitcher of Ma's lemonade—and doused the flames. The set hissed, sputtered, and died in a cloud of acrid steam that smelled vaguely of citrus and impending divorce.

Undeterred (Zeke was nothing if not undeterred), he made improvements. He fabricated a proper drip pan from an old washtub. He added a longer exhaust stack that vented out the window, much to the delight of the neighbor's chickens who now roosted as far away as possible. He even rigged up a small governor using baling wire and a screen door spring so the engine wouldn't race quite so enthusiastically during key-down periods. The dynamo output became steadier, and Zeke's signal reports improved from "chirpy" to "slightly wobbly but loud."

Word spread through the amateur fraternity. Soon, fellows from across the Midwest were writing for schematics of Zeke's modifications. One enterprising ham in Nebraska adapted the Thermo-Dyne to power his spark transmitter, achieving what he claimed was a new record for "gasoline-powered DX" by working a ship off the California coast. Others reported using the waste heat from the engine to keep their coffee warm during all-night contest operations—a feature Montgomery Ward had not advertised but which proved surprisingly popular.

Of course, there were drawbacks. The noise was tremendous; neighbors complained that Zeke's QSOs sounded like a threshing machine having an argument with a nest of wasps. The smell of naphtha permeated everything. Ma eventually banned the rig from the parlor after a minor incident involving curtains and a thrown spark. And the fuel consumption was prodigious. A long ragchew could consume enough white gas to run the family's cream separator for a week.

But the romance of it! Imagine, in an era when most hams were still begging for B-batteries from the local garage, being able to fire up your own power plant and shout into the ether with the authority of industrial combustion. No sagging filaments when the dry cells gave out. No frantic cranking while trying to copy a weak signal. Just the steady putt-putt of progress and the knowledge that your transmitter was literally running on the same fuel that powered the tractors reshaping American agriculture.

By the early 1930s, of course, the writing was on the wall. Rural electrification projects were spreading, and cheaper, cleaner battery-powered and AC sets were flooding the market. Montgomery Ward quietly discontinued the GW-1927 after a few years, though service parts remained available well into the Depression. Most surviving examples were converted to more sensible power sources or, tragically, scrapped for their brass and copper during the war years.

Yet the legend lives on. Every so often, a dusty cabinet turns up in a barn sale, its fuel tank still smelling faintly of naphtha and adventure. The intrepid restorer who dares to fire one up—after replacing all the perished seals, fabricating new gaskets from modern materials, and installing a carbon monoxide detector the size of a breadbox—experiences something profound. Not just the thrill of vintage radio, but a connection to an era when amateurs were expected to be part mechanic, part fire warden, and entirely fearless.

In our safety-obsessed modern world of wall warts and software-defined radios, the gasoline-powered transceiver stands as a monument to ingenuity and questionable judgment. It reminds us that communication has always come with risks. Sometimes those risks smelled like hot metal and white gas. Sometimes they filled the shack with cheerful blue flames and the sound of a small engine doing its valiant best.

So the next time your perfectly engineered transceiver drops carrier or your laptop battery dies mid-pileup, pause for a moment. Think of Zeke Hargrove, pumping that primer, striking that match, and sending his call into the night while the Thermo-Dyne chugged away beneath him. In that glorious, smoky, ear-splitting moment, he wasn't just making a contact.

He was making history—one carefully vented, highly flammable QSO at a time.

~ Based on "A gasoline-powered clothes iron" Hack-A-Day.

Radio Ramblings

"Grab Bag"

by KEVIN McQUIGGIN VE7ZD / KN7Q

Kevin VE7ZD/KN7Q is active in EME, meteor scatter and much more. He lives on Vancouver Island.

This month I'd like to cover a couple of different topics. It's summer, after all, and we all like a little light reading that will go well with coffee on the balcony or the summer barbeque. I hope that you have a fun and relaxing summer and have an opportunity to "do radio" and spend time on other activities that interest you.

We'll start with a short amateur radio travel guide to Vancouver Island, and follow that up with a mid-level dive into restoration of an 1890s pump organ here at VE7ZD. It wasn't a radio project, but nonetheless it was quite interesting.

Thanks for the positive feedback on Radio Ramblings over the past year. We've covered a lot of interesting technical topics and looked at some of the "human" aspects of using new technologies such as artificial intelligence (AI). More to come starting in the next issue.

Ham Travelogue: Vancouver Island

For SARC members or other readers thinking of visiting Vancouver Island (VI) this summer, here is a rundown of things you can do and places you might like to visit. Laura VE7LPM and I have lived here since late 2022, so we now have enough time "on Island" to make some good recommendations.

I've taken an amateur radio perspective on this topic and included services that you can use as a visiting ham, and sites that might be of interest. Here are of my observations and suggestions.

Low Ambient Noise

One of my first observations after we moved here from Burnaby was the amazing drop in my receiver's "noise floor" on the HF bands. I see about a -125 dB noise floor on 20 metres. This is much improved from the -80 dB that was normal in Burnaby! Figure 1 shows a recent screenshot of my rig's waterfall display.

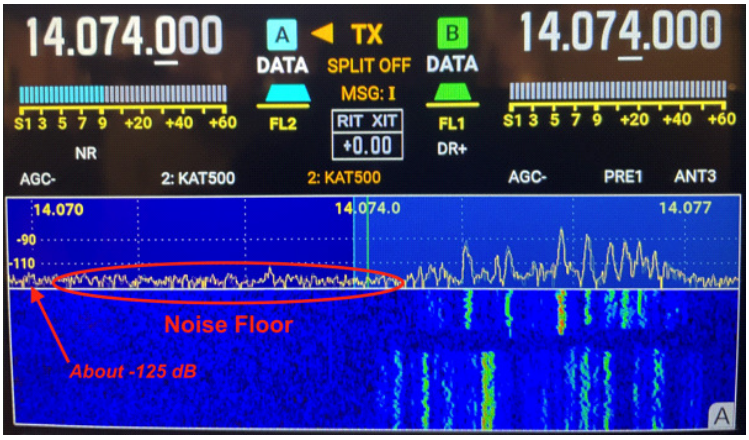


Figure 1 – Waterfall Display with Noise Floor Identified

For example, on 20, 15, and 10 metres my noise floor dropped 30 to 40 dB from what it was at our home near Metrotown in Burnaby. A 30 dB drop is 1,000 times lower noise; a 40 dB drop is 10,000 times [1].

This an amazing improvement and it has had great benefits for DXing!

With 30 to 40 dB less noise, I can hear HF signals here in Courtenay that I never could have heard in the Lower Mainland. This is a function of the smaller population and the lower population density. The lower population density means less radio frequency interference (RFI) from all their electronic gadgets, those "necessities of life" that seem these days to be cheaply designed and built with only minimal filtering. The smaller number of these RFI-generating devices means much less interference on HF and VHF+ bands.

When I put up a simple longwire antenna soon after our move to Courtenay and powered up the rig, I thought that it had been damaged in transmit. The waterfall display didn't show a noise floor; I heard signals in the speaker, but the display didn't show anything at all.

It took a few minutes to figure out why. I just had to readjust the waterfall display's calibration: this brought the noise floor back onto the display. When I did that and saw 30 to 40 dB less noise on the HF bands than in Burnaby, I could hardly believe it.

The takeaway for visitors to the Island: RFI still exists, of course, but the RX situation for amateur radio is much better here than it is in the Lower Mainland. Outside of the big cities (Victoria and Nanaimo), you will be able to appreciate how much less noise there is on HF and 6 metres, and you will be able to work stations that would never hear in the "the big city".

Let's look at some possible operating activities.

Weak Signal Operation: Meteor Scatter and EME

With lower noise levels on the VHF+ bands, weak signal modes such as meteor scatter (MS), VHF/UHF DXing and Earth-Moon-Earth (EME) or "moonbounce" become much more interesting. Much weaker signals can be copied, and this increases opportunities for DX. I have worked well over 200 new grids in QSOs on VHF/UHF/1.2 GHz.

Visitors: consider a collapsible long Yagi for VHF/UHF or above. Bring an SSB or digital mode capable radio if you have one. Most operations on VHF+ these days are using digital modes such as Q65 or FT8. The low noise level means that you can hear many more stations, especially from higher elevations, than you would in the Lower Mainland. Plus, as detailed below, you'll be in a rarer grid square than the "ho-hum" CN89 that DX operators usually work!

Summary of this section: operating with a lower noise floor and without having to deal with strong RFI is just more fun, and if you visit Vancouver Island on holiday, or even for a long weekend, I'd suggest bringing along your HF gear and a simple antenna. If you can, bring a directional antenna for VHF+ as well.

Sought-After Grid Squares

Hunters of POTA and SOTA QSOs and weak signal enthusiasts (meteor scatter (MS) and VHF/UHF/microwave ops) would be very interested in working you on HF if you choose to operate from

a park or summit on Vancouver Island, or if you bring some portable antennas that allow you to get on the meteors or operate in one of the VHF/UHF/microwave contests.

Consider being an activator when you visit the Island: you can put some rarer grid squares on the air and have fun “being the DX” rather than chasing it.

Vancouver Island covers eight grid squares, as shown in Figure 2.

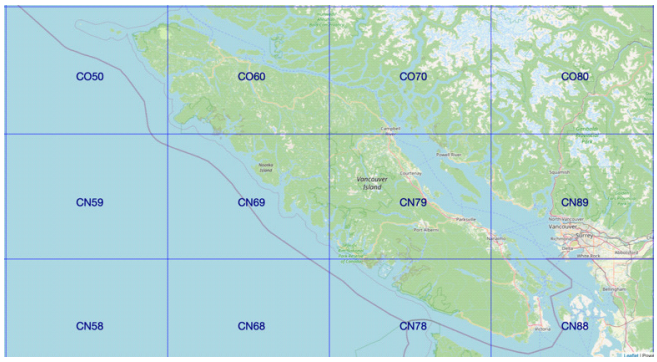


Figure 2 – Grid Squares on Vancouver Island [5]

Many of these grid squares are home to few amateurs and are not activated very often. The most populous grids on the Island are CN88, CN79, and the greater portion of Nanaimo in CN89. CO70 and CO60 include Campbell River, Port McNeill, and Port Hardy. They have a smaller ham population so a visitor could probably generate some interest via POTA or SOTA, or on VHF+ operations.

Grids CO50 and CN69 have, to my knowledge, rarely been activated and would represent the best opportunity for the visitor who wants to activate a grid that will draw attention on HF or on VHF+ bands. The portion of CN78 along the Pacific coast and west from Victoria has lower population and few hams as well, but the grid will have had more activations because of its eastern portion being close to suburbs of Victoria and Nanaimo.

The ultimate ham destination on the Island for those interested in grid activation and portable operation from a rare location would be a trek to Cape Scott in grid CO50, at the extreme northern end of the Island. The starting point after driving north on highway 19 would be Port Hardy. Secondary and tertiary roads head north to Cape Scott Provincial Park.

Digital Modes Will Simplify Portable Operation

Modern digital technology supports weak signal work in that your station does not need to have a massive antenna array and a kilowatt of power. Even EME QSOs are possible these days with one or two long Yagis and 100 watts. Bring a laptop with WSJT-X installed on it.

As an EME and 6 metre MS op, I would be extremely popular if I chose to operate portable from, say, grid CO50 or CN69 as they have probably never been activated on MS or EME.

Some of these grids, however, ar==e hard to get to as the highway network on the Island is not as well developed as it would be in a more populous region. Highway 19 is the major highway that runs along the eastern half of the Island, right up to Port Hardy, but secondary highways heading west from 19 towards the Island’s west coast limit driving destinations to bigger towns near the western coast of the Island on the Pacific Ocean.

The terrain to the north and south of these secondary highways is very mountainous, and while forest service and logging roads exist, they are not navigable with average vehicles. Provincial regulations also require vehicles on forest service or logging roads (FSRs) to be equipped with commercial VHF/UHF radios, and this requires a commercial radiotelephone license. This is a safety issue, seeking to prevent serious collisions with logging trucks rolling down mountains in dangerous terrain.

Not many hams have the necessary commercial license or radio, so driving FSRs to get to a mountaintop or un-activated grid square is impractical and frankly too dangerous. Get your commercial radiotelephone license and buy a commercial VHF radio before you do this. They are not too expensive.

Options to get to rare grids still include hiking in on foot, via canoe or kayak, or for the *really fortunate*, via floatplane. If you can get there, there are excellent activation opportunities!

The Island Trunk System

Vancouver Island is home to 121 repeaters [7] which operate on frequencies in the 6m, 2m, 1.25m, 70cm and 23cm amateur bands. All but the most remote parts of the Island have repeater coverage, and I have found the repeater community on the Island to be extremely friendly and helpful.

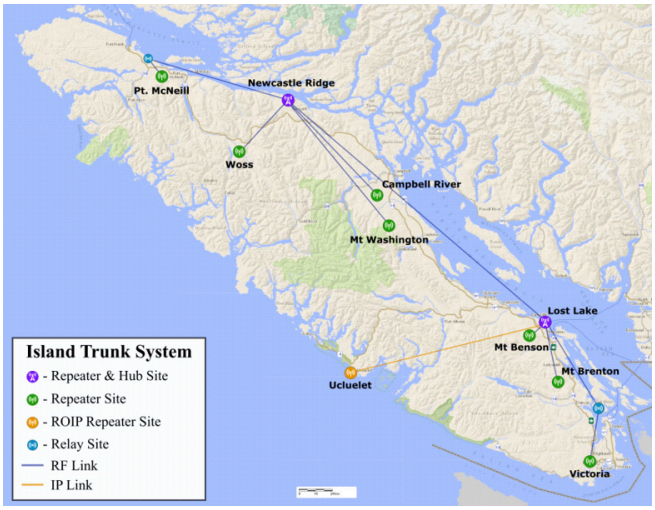


Figure 3 – Island Trunk System, October 2024 [8]

I have found the most impact, however, with the impressive Island Trunk System (ITS) [6]. This is a network of thirteen cross-linked repeaters: all repeater traffic is multicast across all thirteen machines. See Figure 3. The location and frequency of each of the repeaters is documented at http://www.islandtrunksystem.org/cms/node/19.

These repeaters have excellent coverage and VE7LPM and I have been able to access the ITS in a remote area with no other amateur repeater coverage - and certainly no cellular coverage - to report a passenger vehicle that had gone off-road and flipped on its side. Fortunately, the family (tourists from outside of Canada) were all okay, but the ITS was key to getting emergency services on the way. Cellular coverage would have been at least a thirty-minute drive away.

In general terms, the ITS machines are located on prominent mountaintops and have solar power as backup to BC Hydro service. Geographic coverage spans almost the length of the Island, from Victoria to Port McNeill, and westward to Ucluelet and Port Alberni.

The ITS is also fun to monitor because it has developed its own community, with participants spread out geographically across the Island. It typifies the more relaxed community spirit that dominates on the Island. Life moves at a slower pace here, and that is one of the things that Laura and I enjoy most about our new environment.

Clubs, Field Day, POTA and SOTA

There are several local clubs on Vancouver Island, but I have not had time to fully investigate or attend many meetings. Laura VE7LPM and I did attend the Field Day setup of the Comox Valley club a couple of times, but I have yet to join the club or get further involved. I am too busy with personal projects and SARC activities!

The Comox Valley club has quite a few members and is active in community service support. It is also particularly active with high-altitude balloon launches. I attended the launch of one of their balloons in mid-August 2025 at a local park. The balloon was dedicated to a recent Silent Key (Ted Simpkins, VA7YQQ) who was a member of their club. The payload was composed of GPS and basic atmospheric sensors and a WSPR transmitter that operated on 20m.

The launch event was attended by about twenty-five club members and members of the SK's family. The balloon stayed aloft for 263 days and travelled just under 500,000 kilometers in 15 circumnavigations of the Earth [9].

POTA has an active community on the Island and there are over 100 parks listed on the POTA website (https://parksontheair.com/#/map). See Figure 4. All the parks have merit, but some offer spectacular scenery as a bonus. Most are easy to get to by car, and many others are accessible via a short hike in from a convenient parking spot.

An alternative POTA user interface that clearly identifies park boundaries has been created by Volker Kerkhoff EA7KLK. This rendering has some advantages because some of the parks (for example, Strathcona Park) are huge and can be activated from several locations. See the righthand side of Figure 4.

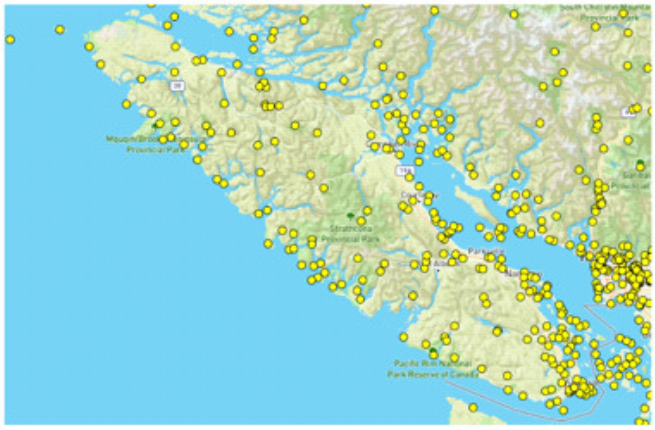


Figure 4 – Vancouver Island POTA Locations [10]

I must thank fellow SARC-expatriate John MacFarlane VA7PX of Qualicum Beach for sparking my interest in POTA. I had never tried the activity until last summer, but am now an enthusiastic supporter.

Sites of Interest

Let's close out this section by briefly identifying other sites that may be of interest to ham-travellers looking for interesting destinations on the Island.

A) Teleglobe Canada Ground Station

A decommissioned Teleglobe Canada satellite and microwave-relay ground station is located between Lake Cowichan and Youbou in the central South Island. It opened in 1972 but was mothballed in the late 1990s when these international telecommunication links were replaced by fibre optics. See its location (red pin "Teleglobe") in Figure 5.

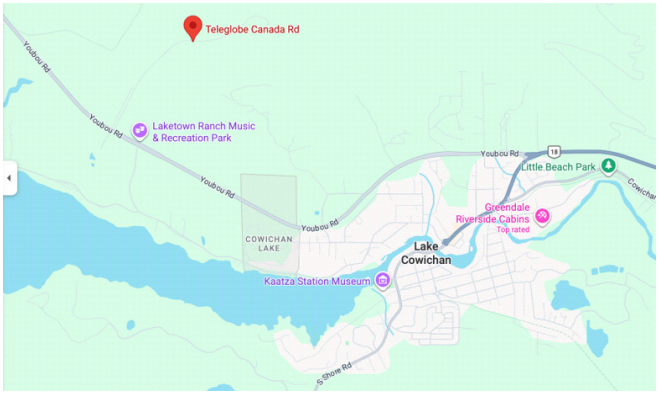
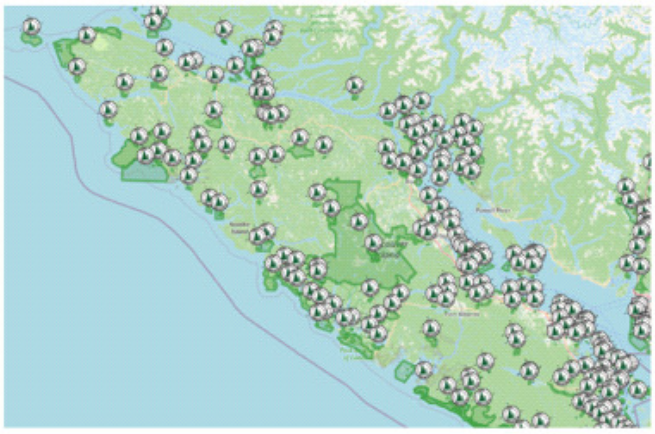


Figure 5 – Location of Abandoned Satellite Ground Station



Lake Cowichan is located about a 1.5-hour drive north of Victoria, and about the same driving time from Nanaimo. Lake Cowichan is a nice community and the scenery out towards Youbou and in the area is excellent.

To get to the Teleglobe site, head for Lake Cowichan and then head westerly on Youbou Rd. At the Laketown Ranch Music and Recreation Park, which will be on your right, turn a hard right and head up Teleglobe Canada Rd. The road dead-ends at the satellite station parking lot in about 1 kilometre.

The station is abandoned, but it makes an interesting site even if it is surrounded by fencing and "no trespassing" signs. If you have a small drone, then there are opportunities to shoot interesting video over the site and take pictures of the antennas.

The parabolic antennas for the station remain in place, and the sheer size of some of these antennas, and their number, is impressive. See Figure 6.

Resurrection of one of the larger parabolic antennas by a group of keen amateurs, to put it on EME or to even try "Venus bounce" would be a fantastic but complex project. It would likely require a solid team, strong technical skills, fundraising, and lots of bureaucratic work to get access to the antenna, and to get the antenna moving and operational again.

That said, reactivation of old MILCOM (military communications) dishes and obsolete radio telescopes has been achieved by amateur groups in the USA (the Deep Space Exploration Society, see http://dses.science/) and the Netherlands (The Dwingeloo Radio Telescope, see https://www.camras.nl/en/about-the-radio-telescope/), so this remains a possibility!

Figure 6 – Teleglobe Antenna Farm

B) Dominion Astrophysical Observatory (DAO)

Located in Saanich, just north of Victoria, the Dominion Astrophysical Observatory was built in 1918. It is located on a local peak now called Observatory Hill. It's a National Historic Site.

Figure 7 – The DAO [11]

The observatory maintains a 1.85 metre (73 inch) optical telescope designed in 1910, and at the time of its construction it was to be the largest telescope in the world. A second optical telescope was added to the site in 1962.

There's an interpretive centre on site and it would make for an interesting visit if you are travelling on the Island or even over to Victoria for the day.

With that, let's move on to another item in the "grab bag".

Non-Radio Projects at VE7ZD

The Communicator is an amateur radio magazine, but nonetheless I would like to touch on one of my current "non-radio" projects to emphasize the value of exercising your brain in a broad range of fields.

Ham radio is my main hobby, but I also get a lot of satisfaction by spending time on other projects that do not involve radio, computing, or antennas. Visiting a different "mental space", especially in the analog realm, gives the brain a rest and can also help you develop new skills that you may later be able to use in another area such as in amateur radio.

As the old saying goes, "a change is as good as a rest", so let's look at a recent non-RF project at VE7ZD.

Pump Organ Restoration

A couple of months ago I reached a milestone on a twenty-five-year project: that of refurbishing, repairing, and rebuilding a pump organ [2] that was built in 1892. See Figure 8.

A pump organ has two pedals that generate a vacuum in an internal bellows. This vacuum then pulls air through the reeds as keys are pressed on the instrument. The user must coordinate pumping the pedals with his playing to maintain the vacuum. Levers on a "stop board" (above the keyboard) place various portions of the internal mechanism into or out of the airflow, altering the characteristics of the sound from the instrument.

Music played by a competent organist on a pump organ can sound beautiful. A short example can be viewed at https://www.youtube.com/watch?v=vrf682-J-mc.

Figure 8 – Our Restored 1892 Pump Organ

Background

Laura VE7LPM and I acquired the organ as part of a purchase of three 1920s broadcast-band AM receivers from a friend in Burnaby in about 2000.

My friend placed an odd condition on the purchase: *"If you buy the three radios then they will come with a free pump organ"*.

An unusual but interesting dilemma. What would we do with a vintage pump organ? Neither of us play the organ or piano, but the AM receivers were fantastic, so I didn't want to lose the deal. Conversation was futile: taking the organ was a condition of sale. After some thought, I agreed.

My friend was very happy, and I noticed that his wife was smiling more broadly than him [3].

I had a small truck, so into the bed went the organ and the three radios. Laura and I decided that we should not take the instrument for free, so I wrote my friend an extra cheque and ensured that he cashed it.

The organ was in fair shape. It played, but the bellows leaked, some stops did not work, and a few of the keys sounded raspy or did not work. It went into our living room in Burnaby, and I fiddled with it periodically over the ensuing years.

One of the foot pedal pump straps broke in about 2005. This added further gravitas to the need for repair.

Figure 9 – The Organ Needs Repairs

It clearly needed repairs, but I knew absolutely nothing about pump organ technology and wasn't sure that I could fix it. Out of a sense of obligation, we took the organ along when we moved to Courtenay in 2022, and I resolved to get it going as the first project in our new home.

I started disassembly of the organ in May 2023. See Figure 9. I took photographs as I removed

each of the parts, labelled them and stored them on a large table in a methodical fashion. These photographs would prove invaluable two years later when I undertook reassembly.

Mechanism

As I disassembled the instrument, I started to form a basic understanding of how it worked. I was still operating largely in the dark, but I deduced that the organ is composed of three sub-systems (see Figure 10):

The stop board: that portion of the instrument that controls air flow between the bellows and the reeds;

The action: the keyboard (61 keys) and a complex set of actuators that control the valves that drive the reeds. The action also "factors in" the combination of stop board settings; and

The bellows: the system which serves as air supply to the rest of the organ.

The bellows incorporates a set of two double valves as shown in Figure 9 (top row, center photo). The first valve opens to create a vacuum in the bellows when the pedals are depressed, and the second valve applies the vacuum to the reeds to draw air through them and produce sound. The bellows must be airtight, and the valves must open and seal reliably.

Most impressive to me was that the pump organ is a completely mechanical device: the complex interaction between the three subsystems takes place using clever linkages made of wood, with mechanical assistance of a set of metal rods and a number of springs. Other materials including felt, leather, and cardboard provide dampers and control the secondary airflow. Sixty-one brass reeds in two banks within the action provide the individual musical tones.

User input via the keys, stops and pedals is processed by this mechanical marvel to generate the instrument's audio output.

Cleanup

The organ was very dirty, being over a century old. Dust and dirt were caked onto the rods and levers, into the key bed, and dirt had migrated deeply into the stop board and the action. Several long wood screws were stuck in place, and a quantity of oily material covered part of the top of the action. The need for cleanup is clear in Figure 11 *[next page]*.

The metal parts had tarnished with some rusted, and some parts in the action had jammed through the sheer volume of dust and hair inside the unit. It was an ugly mess!

Figure 10 – Organ Subsystems

Figure 11 – A Century of Grime

The felt which acted as a moderator between wooden and metal parts to reduce wear and dampen

mechanical action had to be removed and discarded. The fabric on the pedals (see Figure 9) and on the front of the organ had almost disintegrated.

Thanks to the local "Fabricland" and a small leather repair shop in Courtenay, I was able to acquire new raw materials to replicate the worn-out parts.

I spent probably a week measuring and cutting new felt, leather valves and dampers, and a cardboard part for the "Vox Humana" – a stop-controlled sound effect unit that used a rotating card to add vibrato to the organ's sound, to mimic the human voice. The Vox Humana is shown on the right in Figure 12.

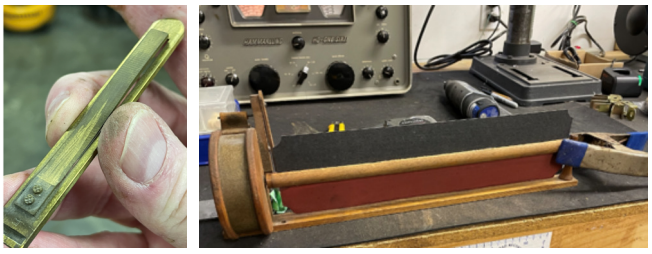


Figure 12 – Brass Reed and Vox Humana

While the rest of the organ was filthy, the top of the bellows in stark contrast had been sealed off by a large leather gasket that ran around its perimeter and interfaced to the underside of the action. The bellows internals and the underside of the action holding the reed valves were pristine: no dirt, dust, or corrosion. See the bottom two photos in Figure 10 above. All that was needed for this section was gasket refurbishment.

Bellows Repair

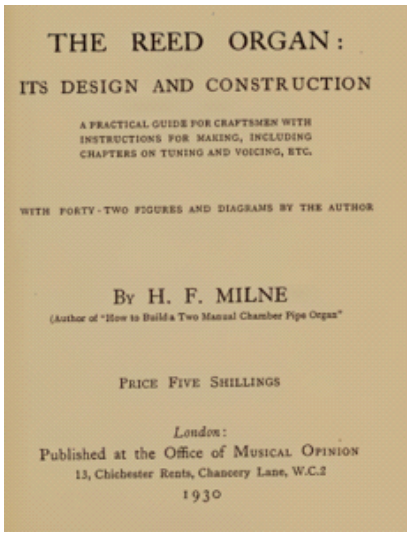
The bellows membrane was made of glued canvas covered with tar – probably the best sealant available in the 1890s. This kept the canvas flexible and allowed the bellows to inflate and deflate during a musical performance.

Unfortunately, the canvas had a couple of small leaks. This made it difficult to maintain a vacuum as ambient air was entering the bellows through these holes.

My solution was to apply the "Flex Seal" liquid rubber product, in both spray-can and brushed form, to the leaks and to the entire exterior of the bellows membrane. After a week of drying, tests confirmed that the bellows was now airtight.

Internet Archive to the Rescue

In any restoration, radio-based or otherwise, it is important to seek information on the object being studied. I had questions that could not be answered through examination of the organ parts. Fortunately, I was able to find a book on pump organ restoration and repair on the Internet Archive that I found to be of some help. "The Reed Organ: Its Design and Construction" by H. F. Milne [4] was published in 1930. See Figure 13.


THE REED ORGAN:

ITS DESIGN AND CONSTRUCTION

A PRACTICAL GUIDE FOR CRAFTSMEN WITH INSTRUCTIONS FOR MAKING, INCLUDING CHAPTERS ON TUNING AND VOICING, ETC.

WITH FORTY-TWO FIGURES AND DIAGRAMS BY THE AUTHOR

By H. F. MILNE

(Author of "How to Build a Two Manual Chamber Pipe Organ"

PRICE FIVE SHILLINGS

London:
Published at the Office of MUSICAL OPINION
13, Chichester Rents, Chancery Lane, W.C.2
1930

Figure 13 – Pump Organ Repair Book

From the text I learned a bit about the vacuum-based bellows and the differences in construction between organ manufacturers. Our organ was designed and manufactured by the Newman Brothers organ company in Chicago, Illinois. I learned that "Newman Bros" was a major manufacturer of parlour organs (the marketing name for the instrument) and that they had produced over 20,000 organs between 1890 and 1920 [13].

Date Stamp and Tuner's Signature

During disassembly, I found the organ's serial number on the action (46218) and a date stamp of July 1892 ("92 7") inside the cabinet (Figure 14). This is the likely date of the cabinet's manufacture.

Figure 14 – Date Stamp and Serial Number

I also found a signature and date written in pencil on the underside of two of the keys. See Figure 15. The top key seems to hold a signature, the bottom key a date. The date is readable and says "11-9-98". This is likely the date when the action and keyboard were tuned, as from my research this practise was common in the organ industry: the tuner would sign a key and use an adjacent key for the date.

The name of the tuner is only partially readable, but it appears to be something like "Chas Bristow". "Chas" is a 19th/early 20th-century abbreviation for "Charles".

This was quite an interesting discovery, and it brought me closer to the people who had designed, constructed, assembled, and tuned the organ that September day in 1898. It gave me real pleasure to bring the instrument back to near-complete functionality!

Figure 15 – Signed and Dated [12]

Repair, Refurbishment, and Reassembly

In 2024 I completed repairs and refurbishment on the stop board, and it was ready for reinstallation. I tackled the action next, in late 2024 into 2025. Repair of the action was the most time consuming and complicated aspect of the project.

Sixty-one keys and their keying mechanisms were removed and cleaned. Two metal lever beds (Figure 16 *next page*) which use levers and actuators to couple bass and treble keys together based on stop settings, were removed, disassembled, cleaned and replaced. This was tedious work. Dozens of little felt pads are used to dampen and align these metal rods, and wooden tabs linked them to their associated stops.

Lastly, I removed all the reeds from the action, cleaned them, and reinserted them into the front and rear reed bays. The reeds are very hard to access so this required further disassembly. I fabricated a "reed puller" tool by grinding down a common crochet hook and filing

it to match the unusual shape required. The tool allowed me to reach into the reed bay and remove (and later reinsert) each reed.

Numbering of all the keys and reeds was critical. Without good documentation I would never have been able to get them back into their correct spots.

I disassembled the pedals, sanded and repainted their metal frames and their signature "N" and

Figure 16 – Lever Beds

"B" (Newman Brothers) monogram, and replaced the threadbare pedal fabric with heavy upholstery fabric of similar pattern purchased from Fabricland. Reassembly work in progress is shown in Figure 17 below.

I then tackled the stripping and re-staining of the organ cabinet. This took several months due to the detail work required and previous water stains. Other than a few odds and ends, the organ was ready to go back together in the spring of 2026.

Reassembly went generally well, with only a few snags as I discovered gaps in my photographic record and note taking. Parts might have been misplaced for awhile, but luckily, I didn't lose any of them. A bit of head scratching and googling resolved the remaining problems, and by May 2026 the organ was operational again, for the first time in at least twenty-five years.

Remaining Work

Figure 18 – Remaining Work

There are three remaining tasks, as shown in Figure 18. First, one key top has been lost and needs to be replaced, as seen on the left of the figure. The original key tops were ivory, but fortunately plastic replacements are now available that duplicate both the colour and texture of the original ivory ones.

Figure 17 – It's Coming Back Together

Second issue: the keys on the organ need to be "leveled" so that the key tops are straight across. The differing key levels are easily seen in the figure, top right. Lastly, the stop labels have faded, and new inserts need to be placed at the front of the stops.

Fortunately, a couple of vintage organ supply shops still exist, so I will be able to order the plastic replacement key top and new stop labels in the coming weeks.

It was a long road to get this 1892 instrument operational again, but well worth the effort. I learned a lot about mechanical solutions to problems and was impressed how such a complex piece of equipment could be constructed out of basic materials. Kudos to the designers and technical workers of the 19th century who devised these beautiful instruments.

The organ will live on in our home, and hopefully remain functional for another 130 years.

Conclusion

We've covered a lot of ground on two topics, and I hope that you found the article interesting.

If you choose to visit Vancouver Island, then make use of the repeater systems, bring along your POTA or VHF+ gear, get into the relaxed approach to life on the Island, and consider visiting some of interesting sites such as DAO or the old Teleglobe satellite ground station.

The pump organ project was an interesting diversion for me from my usual radio- or computing-based projects. It was clear that the analytical and problem solving skills that we use as hams can be applied effectively to projects far, far removed from amateur radio.

I was impressed with the creative use of wood, springs and levers in the organ, and was very happy to bring a 130-year-old musical instrument back to life.

Feedback on Radio Ramblings is always welcome and may be directed to the Editor, or directly to me at mcquiggi@sfu.ca. Thanks for reading!

73,

~ Kevin VE7ZD / KN7Q

References:

[1] An easy way to translate signal strength dB (decibel) levels to a more understandable number is to divide the dB figure by ten, and then calculate 10 to that power. This is easier than it sounds. For example, a 30 dB improvement in a receiver's noise floor is just $10^{(30/10)}$, or 10^3, which is 1,000. A 40 dB improvement is $10^{(40/10)}$, or 10^4, which is 10,000.

The rule of thumb that states that a 3 dB increase in power will double your signal strength can be expressed as $10^{(3/10)}$ which is 10^3, which is 1.995: pretty close to 2. The rule works!

[2] These organs were small enough to fit in private homes and were very popular in the days before broadcast radio. Most sales in North America were in the decades from about 1880 to 1910. Alternative names for a pump organ are a "reed organ" and a "parlour organ".

[3] I surmised that she was very happy to be getting rid of it, as my friend had said that he bought the organ with the intention of repairing it, but never had the time as he was focused on radio repairs.

[4] The book is available for download at the Internet Archive, see https://dn720701.ca.archive.org/0/items/reedorgan0000unse/reedorgan0000unse.pdf.

[5] Interactive grid square map courtesy of Pascal F5LEN. See https://www.f5len.org/tools/locator/.

[6] See their website at http://www.islandtrunksystem.org/cms/.

[7] See the frequency list maintained by the BC Amateur Radio Coordination Council at https://bcarcc.spappz.com/frequency_list.

[8] Current repeater map for the Island Trunk System is at http://www.islandtrunksystem.org/cms/content/link-codes.

[9] https://www.facebook.com/groups/679791545547906/posts/1798889056971477/

[10] The official POTA site map is at https://pota.app/#/map, and the EA7KLK alternate presentation is at https://potamap.ea7klk.es/.

[11] Image from DAO article in Wikipedia at https://en.wikipedia.org/wiki/Dominion_Astrophysical_Observatory.

[12] I worked with ChatGPT to try to enhance the writing and read the name and date on these two adjacent keys. I am fairly confident of "Chas" as the first name but more work, possibly with a forensic light source, would have to be done to bring out the last name of the organ tuner.

[13] Not much is known about this company. See https://www.pumporganrestorations.com/newman_brothers_organ_company.htm

The RMS Field Gateway v1.0

A Purpose-Built Winlink RMS Packet Gateway Appliance for Sysops and EmComm Groups

by STEPHEN LITTLE VE7LWD
[LWD Communications]

The Problem With How Most Gateways Run Today

Walk into almost any EOC, club shack, or home station running a Winlink RMS Gateway and you'll find the same thing — a Windows PC. A laptop, a desktop, sometimes a Toughbook. It's running RMS Packet & Relay, connected to a radio, and doing its job.

Until it isn't.

Windows Update reboots the machine at 3am. A driver change after a security patch silently breaks the audio interface. The firewall blocks a gateway port without warning. Background services compete for bandwidth and slow things down. Hardware reaches end-of-life and the gateway PC needs replacing.

These aren't edge cases. Each of these failures has taken down a real gateway at a real critical moment — and they keep happening because the fundamental problem is never addressed. A general-purpose desktop OS is being asked to behave like dedicated infrastructure.

Gateways are infrastructure. They should not behave like desktops.

A Different Approach

The RMS Field Gateway v1.0, developed by LWD Communications, takes a different approach entirely. Rather than running gateway software on top of a general-purpose computer, it is a purpose-built appliance — a single-function device designed from the ground up to do one job reliably, headlessly, and indefinitely.

At its core is a Raspberry Pi Zero 2W in a fanless aluminum enclosure, running a hardened Raspbian Linux image with a fully integrated software stack. It draws approximately 1 watt at 5V — it can run from a standard power bank. It fits in the palm of your hand. Once configured, it requires no monitor, no keyboard, no mouse, and no intervention.

Reliability comes not from Linux alone, but from reducing system complexity, constraining software scope, and engineering predictable recovery behavior. The system is

Photo: Airbus Critical

designed for unattended long-term operation with automatic recovery from common failure modes.

What's Under the Hood

The software stack is built entirely on open-source components:

- **Direwolf 1.8.1** — a software TNC handling AX.25 packet encoding and decoding over audio, eliminating the need for an external hardware TNC
- **LinBPQ 6.0.25** — the packet node platform managing AX.25 routing, Winlink CMS connectivity, and the BPQ32 Mail Server module
- **BPQ32 Mail Server** — the local post office that stores messages during internet outages and forwards them automatically when connectivity is restored
- **systemd** — managing service startup, sequencing, dependency handling, and watchdog integration

The software stack is open source. What is not open source is the platform — how these components are configured, sequenced, integrated, and hardened into a system that actually works reliably. That configuration is the product.

The Breakthrough: Store and Forward

A standard RMS Packet Gateway does one thing — it connects a radio station to the Winlink CMS over the internet. When the internet is available, messages flow. When it isn't, they don't.

For personal use, that's acceptable. For EmComm, it isn't.

The RMS Field Gateway v1.0 implements full store-and-forward functionality — what the Winlink community calls Post Office mode:

Normal operation: A Winlink client connects over RF, the gateway routes traffic to the CMS over the internet, and the session completes normally.

Internet outage: The gateway detects that CMS servers are unreachable and automatically falls back to local store-and-forward operation. Internet-bound messages (e.g., SMTP destinations such as Gmail and other email domains) are queued for delayed delivery. Winlink-routed traffic is handled within the local BPQ Post Office and spooled locally when a valid mailbox exists. The Winlink client session log indicates "Connected to RELAY." When internet connectivity is restored, queued messages are forwarded to the CMS automatically. No operator intervention required.

Local RF retrieval: During an outage, a second station within RF range can connect over packet and retrieve messages addressed to them directly — without any internet connection. This enables RF-based message retrieval between stations during CMS or internet outages.

Power failure: Messages stored locally during a power loss are preserved. When power is restored, Direwolf and LinBPQ restart automatically in the correct sequence and forwarding resumes. The gateway can even be physically relocated and will behave predictably.

The underlying platform is capable of significantly more. Multi-path forwarding to adjacent VHF/UHF gateways and HF connectivity via ARDOP are within the architecture's reach — candidates for future releases. Early adopters will be first in line.

During field testing, the Gateway operated continuously for multiple days on USB battery power and LTE backhaul while servicing local packet traffic. Recovery testing included repeated power interruption, internet outage simulation, and unattended restart validation.

Engineered, Not Assembled

The distinction between an assembled project and an engineered appliance comes down to what happens when things go wrong. The RMS Field Gateway v1.0 addresses the failure modes that take down real gateways:

Automatic service startup with correct sequencing — Direwolf must bind to the audio interface before LinBPQ initializes. The systemd configuration enforces this dependency on every boot, without exception.

Watchdog protection — The built-in hardware watchdog provides a heartbeat-based reset mechanism. If the OS stops responding or fails to service the watchdog within the configured interval, an automatic reboot restores the gateway to full operation without manual intervention.

Power and internet recovery — The gateway returns to full operation automatically after power loss or internet outage.

Disk and log management — Automatic log rotation, controlled disk usage, and high-endurance storage practices reduce the risk of storage exhaustion or filesystem corruption during unattended operation.

Headless operation — The gateway runs without a connected display. Remote access is available via SSH, VNC, or the LinBPQ Web Management Interface. Raspberry Pi Connect further expands remote access capability.

Setup in 30 Minutes

Despite the complexity under the hood, initial setup is guided and straightforward. The Gateway ships with a pre-imaged SD card — the operator provides their Winlink Sysop credentials, VHF/UHF radio, USB audio interface, and internet connection.

A comprehensive 43+ page photo-illustrated Setup and Operations Manual covers step-by-step deployment, troubleshooting, and advanced configuration:

1. Power up and connect to Wi-Fi (Ethernet, LTE Hotspot, or Starlink)
2. Identify and configure the USB audio interface
3. Update Direwolf configuration — callsign, audio device, PTT method
4. Update LinBPQ configuration — callsign, Sysop password, grid square
5. Configure the LinBPQ Web Management Interface
6. Reboot and verify services
7. Send a test Winlink message

The complex parts — configuration, sequencing, stability, recovery — arrive already done. Most operators familiar with Winlink or Raspberry Pi-based radio interfaces can complete initial deployment in approximately 30 minutes.

Who Is It For?

Gateway Sysops looking to replace an aging or unreliable Windows-based gateway with a stable, low-maintenance appliance that doesn't require ongoing OS management.

EmComm groups and clubs that need reliable Winlink infrastructure at a fixed site — EOC, repeater site, or club station — without depending on a volunteer's personal computer, or worse, donated equipment.

Field deployment — low power draw, small form factor, and power bank capability make the Gateway suitable for portable and temporary deployments. Cellular LTE or Starlink provides the internet link while the Gateway serves the surrounding RF community over packet.

The Gateway supports Digirig Mobile, Digirig Lite, Signalink, and other standard USB audio interfaces, operating on 1200-baud AFSK VHF/UHF packet — the most commonly deployed Winlink VHF/UHF RF mode in North America.

Where It Fits

The RMS Field Gateway v1.0 is not the first Raspberry Pi-based Winlink project — and it shouldn't pretend to be. PiGate (KD0QYN) pioneered the concept of a portable emergency gateway. 73 Linux (KM4ACK) provides a capable ham radio Linux environment with Winlink client capability. DigiPi (KM6LYW) supports virtually every amateur data mode from a single platform.

Most of these tools operate on the client side of the Winlink network — they help operators send and receive messages. The RMS Field Gateway operates on the *infrastructure* side — it is what those clients connect to over RF. The two are complementary, not competing.

What distinguishes the RMS Field Gateway is scope and finish. This is a current, shipping product — not a build guide, a multi-mode experiment, or a general-purpose shack computer. It does one job: run a reliable, resilient Winlink RMS Gateway. The configuration is done. The sequencing is engineered. The recovery behavior is tested. It arrives ready to deploy.

Stephen Little VE7LWD, is a licensed amateur radio operator based in Delta, BC and the founder of LWD Communications.

Availability

The RMS Field Gateway v1.0 is available now through LWD Communications in limited production runs. Early adopter pricing is currently available, with introductory pricing for club and EmComm deployments.

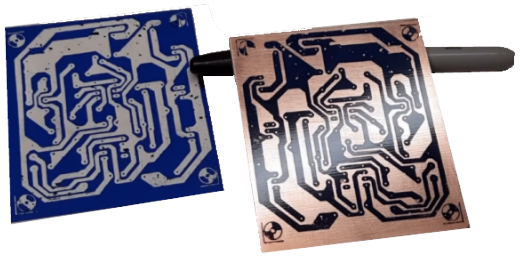
Full product details, specifications, and setup information: www.lwdcommunications.ca

Questions and deployment inquiries: info@lwdcommunications.ca

~ Stephen VE7LWD

PCBs Straight From The Magazine

It's never been easier to get a printed circuit board made. In fact, almost every electronics video out on the internet will incessantly remind you of this fact now. But making a custom PCB wasn't always as straightforward as sending a KiCad file to a board house. Many DIY methods involve harsh chemicals and tedious processes, but did have the potential benefit of taking much less time than waiting on boards to arrive in the mail. [Bettina Neumryr] is demonstrating one of these older methods, called the toner transfer method, using a circuit that was printed directly in an old magazine.



Read the whole article on Hackaday

~ Hackaday

Building Precision Timekeeping:

The NTP Dual Clock

by JOHN SCHOUTEN VE7TI

In amateur radio, precise time synchronization underpins successful contesting, net operations, accurate logging, and reliable digital mode performance. While computers and apps serve many needs, a dedicated hardware clock that displays both UTC and local time clearly and reliably remains a favorite in many shacks. The NTP Dual Clock, developed by Bruce E. Hall, W8BH, delivers exactly that: a self-contained, attractive, and highly accurate timepiece that draws its precision from the internet.

Bruce E. Hall, W8BH, has earned a strong reputation in the ham radio maker community for his clear, educational projects involving microcontrollers, Morse tools, test equipment, and timing devices. His website at w8bh.net offers in-depth tutorials, schematics, code, and construction guides. The NTP Dual Clock builds on his earlier work with GPS and WWVB clocks, providing an internet-based solution ideal for stations with reliable Wi-Fi.

The Heart of the Project

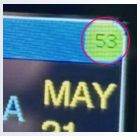
At its core, the NTP Dual Clock uses an ESP32 (or optionally a smaller ESP8266) microcontroller paired with a 2.8-inch 320x240 pixel TFT LCD display based on the ILI9341 driver. No additional complex components are required beyond basic wiring. The clock connects to the internet via built-in Wi-Fi, queries NTP servers for Coordinated Universal Time, and displays both local time and UTC simultaneously on the vibrant color screen.

The display layout features local time and date on the upper portion and UTC on the lower portion, making it easy to monitor both at a glance—particularly useful when local and UTC dates differ across time zone boundaries. Time appears in large, easy-to-read digits styled after classic vacuum fluorescent displays, using a seven-segment font in cyan for a retro yet modern aesthetic. Dates show abbreviated months and days alongside time zone indicators.

How It Achieves Accuracy

Under the Guidance of Dino VE7NX, SARC members previously built a W8BH GPS based clock project. It required an external GPS module but provided very accurate time. This current project, again presented to SARC with tweaks by Dino, relies on the robust Network Time Protocol (NTP), originally developed by Prof. David Mills. NTP synchronizes devices over the internet to within tens of milliseconds of true UTC. The ESP32's Wi-Fi capability makes this straightforward—no external antenna or receiver module is needed, unlike GPS or WWVB solutions. The Wi-Fi access point is easily reset, making it suitable for where there is an available access point or for use in the field if you have data sharing via a hotspot from your cel phone.

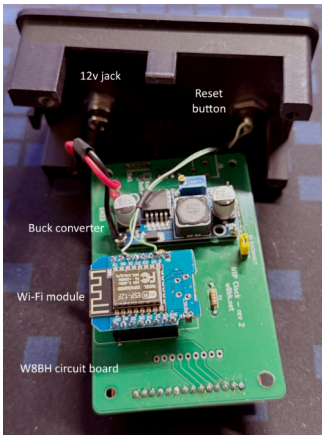
Bruce leverages the excellent ezTime library, which handles NTP synchronization, time zone rules, and automatic Daylight Saving Time adjustments with minimal code. The clock typically resynchronizes every 30 minutes.

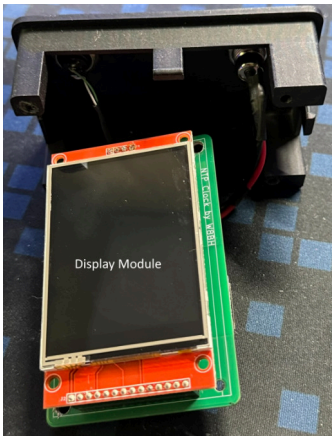


A thoughtful status indicator in the corner uses color coding—green for recent sync (within an hour), orange for up to 24 hours, and red for stale data—while also displaying Wi-Fi signal strength. Additional features include automatic reconnection if Wi-Fi drops and a 2026 update that adds over-the-air Wi-Fi credential configuration via a smartphone web interface using the WiFiManager library.

Building and Customization

Construction follows a logical progression. Builders start by setting up the ESP32 in the Arduino IDE, wiring the TFT display via SPI (with specific pins for CS, DC, MOSI, SCK, etc.), and





installing the TFT_eSPI library with appropriate configuration. The code progressively adds time retrieval, display formatting, local time zone support, status indicators, and finally the dual display.

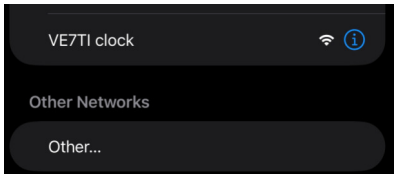
The design supports flexibility. Builders can choose 12- or 24-hour formats independently for local and UTC displays, add a reset button for Wi-Fi settings, and adapt the project for different ESP modules. Bruce provides complete source code on GitHub, PCB Gerbers, schematic, enclosure STL files, and a detailed Builder's Guide. Many have successfully built compact versions using the Wemos D1 Mini ESP8266 for a smaller footprint. The Wi-Fi module is readily available, small and inexpensive.

Power requirements remain modest, suiting continuous 24/7 operation from a standard 5 volt supply to the micro USB port on the Wi-Fi module, or as in our version, Dino added a buck converter that supplies the 5 volts from a rear 12 volt jack. The software includes startup screens showing connection progress and options for serial debugging.

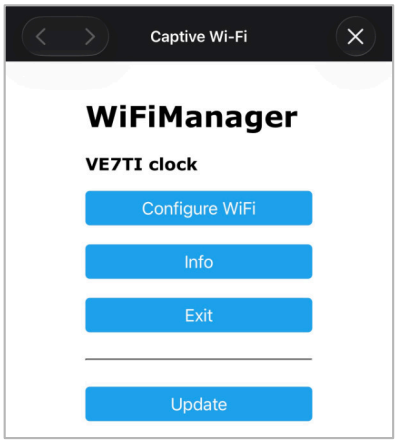
Easy Set-up

First time set-up or changing Wi-Fi sites is very simple. On boot-up you are presented with this screen on your clock and on your cel phone:

NTP clock screen



Cel phone screen



WiFi configuration screen on your cel phone, Select 'Configure Wi-Fi', enter your network name and password and you're done.

Why Hams Love It

The NTP Dual Clock earns praise for its readability, reliability, and practicality in the shack. It eliminates the need for radio-based time signals while delivering professional-grade performance. The dual display directly addresses ham needs for simultaneous awareness of local and Zulu time. Customizability encourages experimentation, and the project teaches valuable skills in embedded Wi-Fi, libraries, and graphics programming.

About the Developer

Bruce's projects consistently emphasize clarity and encouragement for builders of all experience levels. From Morse code tools to precision clocks, his resources have helped countless amateurs deepen their electronics and programming knowledge while creating useful station gear.

The NTP Dual Clock stands as an excellent example of modern ham ingenuity—combining accessible hardware with robust software to meet a real operational need. Whether for your contest station, digital setup, or general shack use, this build delivers satisfaction and precision.

Download the full documentation, including the detailed PDF, 3D printed case STL, and other files from w8bh.net. Source code and updates are available on Bruce's GitHub. Grab an ESP32 or D1 Mini, a TFT display, and start building—you'll end up with far more than just a clock.

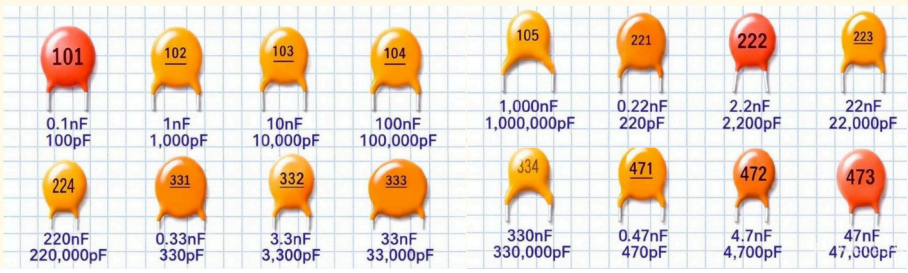
73, and happy constructing!

~ John VE7TI

For this and more inspiring projects from W8BH, visit http://w8bh.net.

A PDF version of the instructions for this clock is at https://w8bh.net/NTP_DualClock.pdf

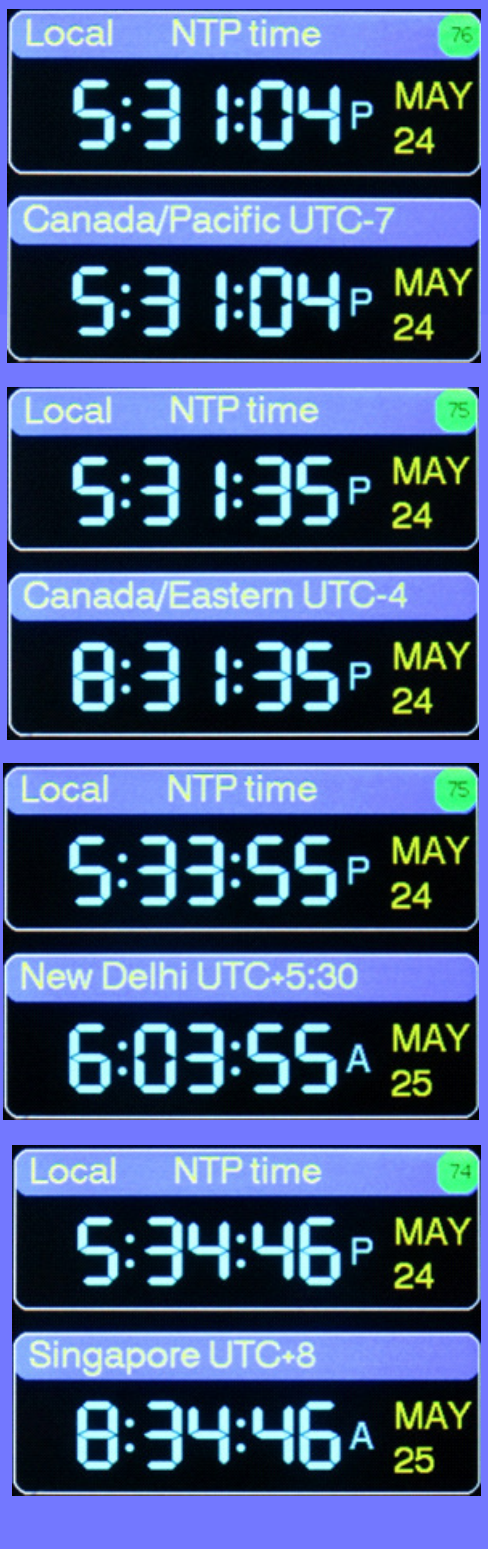
Common capacitor values and their 'codes'



Another version...

An Alternative NTP Dual Clock

by BLAKE R. WIGGS VA7BWG



Introduction

In his excellent documentation for the NTP clock that SARC members recently built[1], Bruce Hall W8BH observes:

> *"There is even a bit of unused space at the bottom of the display which you can use for own modifications, such as weather data, sunspot data, clock temperature, sunrise/sunset details, moon phase, etc. I decided to use that extra space for a second time display. As a ham, it is important to know local time and UTC."*

I don't have an HF radio, so a UTC time reference isn't essential for me. But I thought about Bruce's observations and decided to try converting my NTP clock into a world clock. The basic idea is to keep the upper half of the display as is (e.g. showing the local time), with the lower half cycling through different time zones at 10-second intervals. The name of a city or region in each time zone is displayed, along with the UTC offset currently in effect—taking daylight saving time (DST) into account—as shown in the 4 accompanying photos of my world clock.

Bruce Hall's original Arduino sketch[2] provides an exceptionally clean and elegant dual-display NTP clock for ESP8266/ESP32 hardware using:

- ezTime Library
- TFT_eSPI Library
- WiFiManager Library

The original sketch displays LOCAL time in the upper panel and UTC time in the lower panel. This article outlines the basics of how I modified the original sketch to display a rotating world clock in the lower panel which:

- cycles (i.e. rotates) through multiple international time zones
- handles DST in any time zone
- displays UTC offsets, including fractional offsets
- efficiently redraws the lower panel display
- preserves the aesthetics of Bruce Hall's original display

Original Architecture

Bruce Hall's original `updateDisplay()` function is very compact and efficient:

```
void updateDisplay() {
  static time_t t,oldT,lt,oldLt;
  t=now();  lt=local.now();
                // get latest time
  useLocalTime = true;
                 // use local
timezone
  showTimeDate(lt,oldLt,LOCAL_FORMAT_
12HR,10,46);      // show new local
time
  useLocalTime = false;
                // use UTC timezone
  showTimeDate(t,oldT,UTC_FORMAT_
12HR,10,172);         // show new UTC
time
  showClockStatus();
                 // and clock status
  oldT=t; oldLt=lt;
                 // remember time
values
}
```

That's it! This works exceptionally well if both panels are essentially static, but dynamically displaying a rotating world clock adds complexity.

Requirements for the World Clock

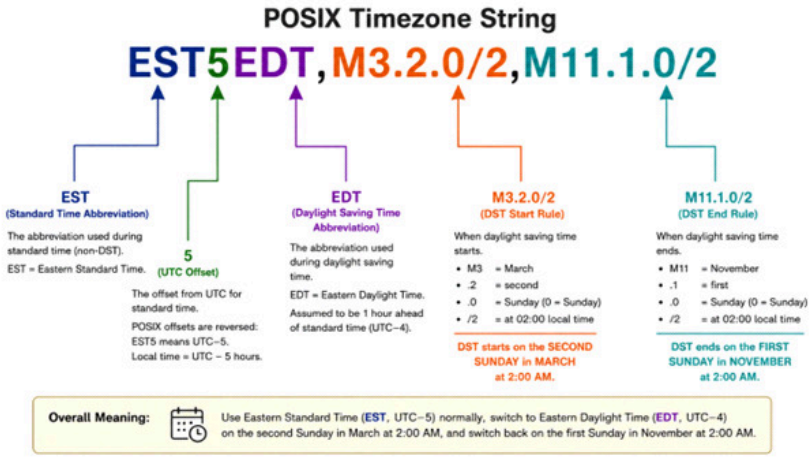
My lower display panel needed to cycle through many time zones; switch time zones every 10 seconds; show the correct UTC offset for each time zone; support DST transitions; support fractional offsets such as UTC-2:30 (e.g. Newfoundland); preserve the white, round-cornered borders framing the lower display; and suppress display rendering artifacts.

Adding World Timezone Objects

The first step is to define Timezone objects, as explained in the ezTime documentation[3]. For example, I defined these global variables[4]:

```
Timezone tzWinnipeg;
Timezone tzToronto;
Timezone tzHalifax;
Timezone tzStJohns;
Timezone tzBuenosAires;
Timezone tzSouthGeorgia;
```

Each `Timezone` object is initialized by the sketch's `setup()` function. This is easily done using IANA time zone identifiers[5] and the ezTime


POSIX Timezone String
EST5EDT,M3.2.0/2,M11.1.0/2
EST
(Standard Time Abbreviation)
The abbreviation used during standard time (non-DST).
EST = Eastern Standard Time.
5
(UTC Offset)
The offset from UTC for standard time.
POSIX offsets are reversed:
EST5 means UTC−5.
Local time = UTC − 5 hours.
EDT
(Daylight Saving Time Abbreviation)
The abbreviation used during daylight saving time.
EDT = Eastern Daylight Time.
Assumed to be 1 hour ahead of standard time (UTC−4).
M3.2.0/2
(DST Start Rule)
When daylight saving time starts.
• M3 = March
• .2 = second
• .0 = Sunday (0 = Sunday)
• /2 = at 02:00 local time
DST starts on the SECOND SUNDAY in MARCH at 2:00 AM.
M11.1.0/2
(DST End Rule)
When daylight saving time ends.
• M11 = November
• .1 = first
• .0 = Sunday (0 = Sunday)
• /2 = at 02:00 local time
DST ends on the FIRST SUNDAY in NOVEMBER at 2:00 AM.
Overall Meaning:
Use Eastern Standard Time (EST, UTC−5) normally, switch to Eastern Daylight Time (EDT, UTC−4) on the second Sunday in March at 2:00 AM, and switch back on the first Sunday in November at 2:00 AM.

`setLocation()` function[6], for example `tzToronto.setLocation("America/Toronto");` I could instead have used `tzToronto.setLocation("Canada/Eastern");` because "Canada/Eastern" is an alias for and links to `"America/Toronto"`[7]. Besides accepting human-readable IANA time zone database names in this so-called Olson format, `setLocation()` automatically retrieves and applies the current DST rule and UTC offset for the selected time zone. However, `setLocation()` requires Internet access to query the ezTime time zone server's database. Furthermore, the author of the ezTime library warns that to prevent being used in DDoS attacks, the ezTime server "will not answer if calls from the same IP come within 3 seconds of one another". This is problematic if you want to work with dozens of `Timezone` objects, as is typical for a world clock[8].

The alternative is to initialize Timezone objects via ezTime's T`setPosix()` function which uses POSIX time zone strings[9], e.g. `tzToronto.setPosix("EST5EDT,M3.2.0/2,M11.1.0/2");` Such strings can be user-defined to specify all of the information required to identify the time zone, stipulate the UTC offset and indicate when DST starts and stops, as shown in the breakdown at the bottom of the previous page.

My setup() function includes `setPosix()` initializations like this[10].

```
tzWinnipeg.setPosix("CST6CDT,M3.2.0/2,M11.1.0/2");
tzToronto.setPosix("EST5EDT,M3.2.0/2,M11.1.0/2");
tzHalifax.setPosix("AST4ADT,M3.2.0/2,M11.1.0/2");
tzStJohns.setPosix("NST3:30NDT,M3.2.0/2,M11.1.0/2");
tzBuenosAires.setPosix("ART3");
tzSouthGeorgia.setPosix("GST2");
```

`setPosix()` operates fully offline—no network connection or time zone database server is required. This eliminates delay inherent in performing online database lookups, achieving faster start-up and is more robust for embedded or long-term deployed devices. However, by using POSIX strings I am hard-coding DST rules and UTC offsets into my sketch, so I will have to edit and recompile the sketch to reflect any future changes in DST rules or UTC offsets.

World Clock Table

I also needed a structure to associate display names with Timezone objects. I defined it as:

```
struct WorldClock {
  const char* city;
  Timezone* tz;
};
```

And then populated it:

```
WorldClock clocks[] = {
  {"Canada/Central", &tzWinnipeg},
  {"Canada/Eastern", &tzToronto},
  {"Canada/Atlantic", &tzHalifax},
  {"Newfoundland", &tzStJohns},
  {"Buenos Aires", &tzBuenosAires},
  {"South Georgia", &tzSouthGeorgia},
};

const int NUM_CLOCKS = sizeof(clocks) / sizeof(clocks[0]);
int currentClock = 0;
unsigned long lastClockSwitch = 0;
```

This approach simplifies time zone rotation logic and banner generation. Note that the time zone names are arbitrary; for example instead of `{"Canada/Central", &tzWinnipeg}` I could have used `{"Winnipeg", &tzWinnipeg}` or `{"Portage la Prairie", &tzWinnipeg},` etc.

Clock Rotation Logic

The information displayed in the lower panel cycles automatically at fixed intervals. I chose 10 seconds, but it's easily configurable:

```
const unsigned long CLOCK_SWITCH_INTERVAL = 10000; // 10 seconds
```

Rotation logic:

```
 if (millis() - lastClockSwitch >=
CLOCK_SWITCH_INTERVAL) {
    lastClockSwitch = millis();
    currentClock++;
    if (currentClock >= NUM_CLOCKS)
      currentClock = 0;
  }
```

This architecture avoids delays and keeps the clock fully responsive.

Bruce Hall's original sketch uses his `showTimeDate()` function to render the time and date for display in both the upper and lower panels. However, the rotating world clock has several requirements exceeding the capabilities of `showTimeDate()`. For example the lower panel's banner changes every 10 seconds; dynamic and fractional UTC offsets require custom formatting and rendering; banner artifacts introduced by replacing a longer character string with a shorter one must be removed; the white, round-cornered frame around the lower panel must be preserved, etc. To handle these requirements I created a separate `showWorldClock()` banner rendering function for the lower panel.

DST-Aware UTC Offset Calculation

ezTime's `getOffset()` function[11] returns UTC offsets (taking DST rules into account) using POSIX conventions, like this:

Actual Time Zone	ezTime Value
UTC+2	-120
UTC-10	+600

Therefore, the signage had to be inverted during display formatting:

```
 int offsetTotalMinutes = tz-
>getOffset();
 int offsetHours        =
abs(offsetTotalMinutes) / 60;
 int offsetMinutes      =
abs(offsetTotalMinutes) % 60;
```

and the correct signage applied:

```
  if (offsetTotalMinutes <= 0)
      label += "+";
  else
      label += "-";
```

This correctly handles UTC+5:45, UTC-2:30, etc. without having to hardcode the offsets.

Avoiding Banner Redraw Artifacts

Another challenge involved banner redraw artifacts. For example, suppose the lower panel's banner displays a lengthy character string such as `Newfoundland UTC-2:30` followed by a shorter one, e.g. `Tokyo UTC+9`. If nothing is done, unwanted residual pixels from the end of the longer string will remain and appear after the shorter string. The solution is to erase the lower panel's banner before redrawing, taking care not to overwrite the white, round-cornered frame. After some trial and error I wound up with `tft.fillRect(6,129,308,24,LABEL_BGCOLOR);`

Maintaining Synchronization

The lower panel's world clock display is updated once per second using the same rendering engine as the upper display: `showTime(worldNow,LOCAL_FORMAT_12HR,10,172);` This ensures that seconds "ticks" are synchronized in the two displays and maintains identical formatting of both displays for visual consistency.

Final Architecture

The final rendering architecture became:

```
updateDisplay()
     ├── LOCAL display
     ├── status indicator
     └── showWorldClock()

showWorldClock()
     ├── rotate time zone
     ├── compute DST-aware UTC offset
     ├── build banner
     ├── erase banner redraw region
     ├── redraw banner (time zone name
with UTC offset)
     ├── render time
     └── render date
```

This separation improves code readability, maintainability and extensibility. The system supports an unlimited number of world clocks with their respective UTC offsets and DST start/stop rules, stable display rendering, border-safe banner redraws and synchronized updates of both displays. Possible future enhancements include fade transitions from one time zone to

the next, DST-in-effect indicators, sunrise/sunset indicators, multiple display themes and more.

Conclusion

None of this would have been possible without Bruce Hall's tremendous effort in designing every aspect of the NTP clock and his provision of excellent, comprehensive documentation plus extensive comments in his original dual-clock sketch. Kudos are also due to ezTime author Rop Gonggrijp, who also provides excellent, thorough documentation.

~ Blake VA7BWG

References

1 Under the able guidance of Dino Gueorguiev VE7NX

2 Available via Bruce's website: http://w8bh.net/NTP_DualClock.pdf and GitHub repository: https://github.com/bhall66/NTP-clock

3 See https://github.com/ropg/ezTime

4 Along with various others, including oddballs like Kiritimati UTC+14

5 See https://www.iana.org/time-zones and https://en.wikipedia.org/wiki/List_of_tz_database_time_zones

6 See https://github.com/ropg/ezTime#setlocation

7 "America/Nassau", "America/Montreal", "America/Nipigon" and "America/Thunder_Bay" are also aliases for and link to "America/Toronto". See https://en.wikipedia.org/wiki/List_of_tz_database_time_zones#TORONTO

8 One of my world clock implementations cycles through 165 different Timezone objects.

9 See POSIX Time Zone Specifications

10 Note that neither Buenos Aires nor South Georgia use DST.

11 See https://github.com/ropg/ezTime#getoffset

A very easy to make - tune / straight key - PTT button.

Press and hold the switch to generate a continuous carrier in CW or AM mode. This allows you to tune an external antenna tuner without unplugging your key, moving it to another jack, or navigating through radio menus—a very convenient feature.

The switch can also function as a CW key and is compatible with many transceivers, making it a versatile accessory with numerous applications. In addition to tuning, it can be used as a PTT (Push-to-Talk) switch for microphones.

Compatible with any transceiver that supports a straight-key input and either an internal or external tuner, it provides a quick and simple solution for tuning operations. When pressed, it can temporarily bypass the key and provide continuous keying without interruption.

Tips For Searching

The Communicator's Online Index

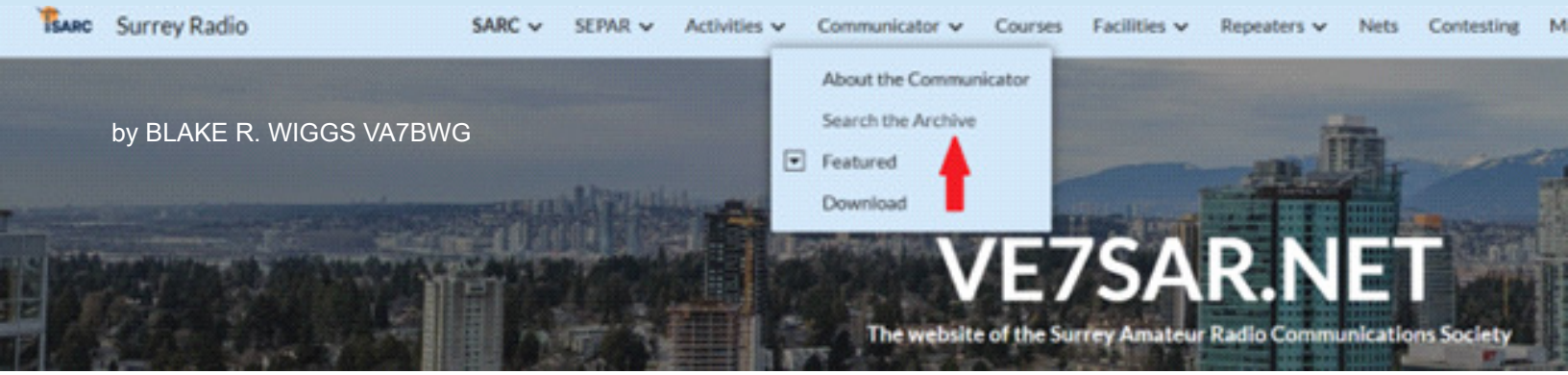


Figure 1 Access the Index via SARC's website: https://www.ve7sar.net/

Introduction

The Communicator's online Index currently encompasses 2,320 articles by 315 authors covering 70 topics spanning 158 issues of the Communicator up to and including the March-April 2026 issue, corresponding to every issue stored in the Internet Archive. Some issues from 1991, 1992, 2007 and 2008 are included, but the Internet Archive collection is complete only from 2009 onward. If you have any of those earlier issues we'd love to borrow them so they can be added to the Internet Archive and included in the online index (please contact communicator@ve7sar.net if you have any earlier issues).

Where is the Index?

Access the index via SARC's website https://www.ve7sar.net/ Choose 'Search the Archive from the 'Communicator' menu dropdown to open the 'Search the SARC Communicator Archive' web page. *[See graphic above].*

Search the SARC Communicator Archive webpage *[See figure 2 below]*

What Information is Indexed?

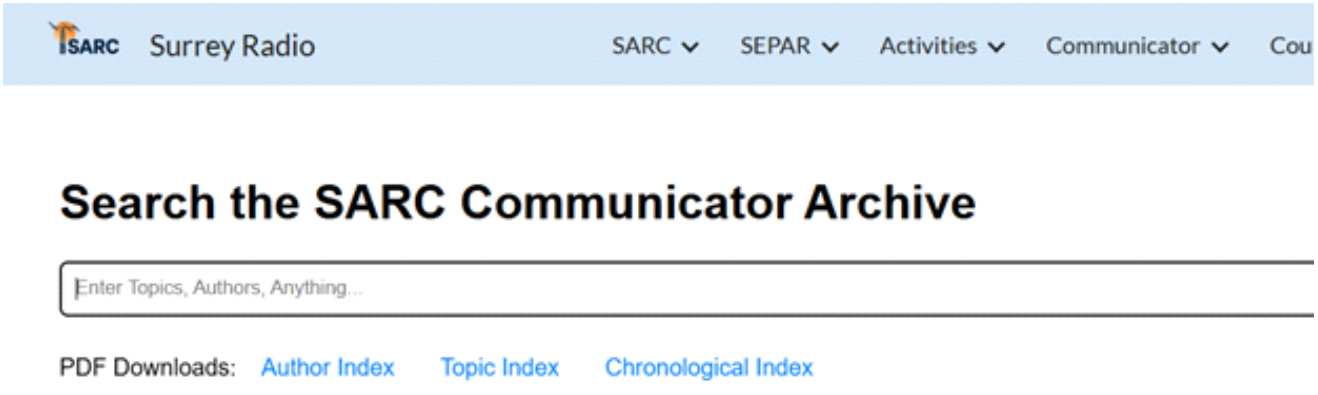
Each entry in the index consists of 5 fields:

Index Field	Example
Topic	Tech - Software Defined Radio (SDR)
Issue	March-April 2026
Article Title	Chameleon Project: Digital Radio [software defined radio overview]
Article Author	Kevin McQuiggin VE7ZD / KN7Q (ex K7MCQ)
Article URL	https://archive.org/details/SARC_Communicator_2026-03/page/16/

Search results are returned dynamically

Thanks to the efforts of Reg Natarajan VA7ZEB, any character typed in the Figure 2 'Enter Topics, Authors, Anything' search box triggers an

Figure 2 Search the SARC Communicator Archive webpage



immediate search for that character in any one of the Topic, Issue, Article Title and Article Author fields, instantly retrieving and presenting the search results as you type. Type a second character and the search results are instantly narrowed to include only items having those 2 consecutive characters in any one or more of the Topic, Issue, Article Title and Article Author fields. Typing a third character further narrows the search results. You'll find that the results quickly converge to a list of articles focused on the characters you've typed.

Searching Article Titles

Suppose you want to read up on end-fed halfwave antennas. Just start typing—after typing only 5 characters 'end-f' you'll have a list of 9 articles (as of the March-April 2026 issue) on EFHW's:

Search the SARC Communicator Archive

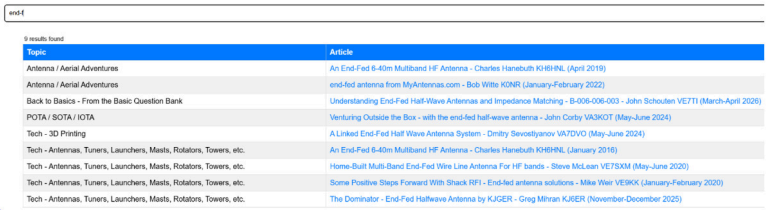

end-f
9 results found
Topic
Article
Antenna / Aerial Adventures
An End-Fed 6-40m Multiband HF Antenna - Charles Hanebuth KH6HNL (April 2019)
Antenna / Aerial Adventures
end-fed antenna from MyAntennas.com - Bob Witte K0NR (January-February 2022)
Back to Basics - From the Basic Question Bank
Understanding End-Fed Half-Wave Antennas and Impedance Matching - B-006-006-003 - John Schouten VE7TI (March-April 2026)
POTA / SOTA / IOTA
Venturing Outside the Box - with the end-fed half-wave antenna - John Corby VA3KOT (May-June 2024)
Tech - 3D Printing
A Linked End-Fed Half Wave Antenna System - Dmitry Sevostiyanov VA7DVO (May-June 2024)
Tech - Antennas, Tuners, Launchers, Masts, Rotators, Towers, etc.
An End-Fed 6-40m Multiband HF Antenna - Charles Hanebuth KH6HNL (January 2016)
Tech - Antennas, Tuners, Launchers, Masts, Rotators, Towers, etc.
Home-Built Multi-Band End-Fed Wire Line Antenna For HF bands - Steve McLean VE7SXM (May-June 2020)
Tech - Antennas, Tuners, Launchers, Masts, Rotators, Towers, etc.
Some Positive Steps Forward With Shack RFI - End-fed antenna solutions - Mike Weir VE9KK (January-February 2020)
Tech - Antennas, Tuners, Launchers, Masts, Rotators, Towers, etc.
The Dominator - End-Fed Halfwave Antenna by KJ6ER - Greg Mihran KJ6ER (November-December 2025)

Figure 3 Searching 'end-f' retrieves 9 articles on end-fed halfwave antennas

Search results are hyperlinked to the Internet Archive

To read any of those 9 articles, click the blue (hyperlink) entry in the search results 'Article' column. This opens your web browser, via the Article URL hyperlink, to the first page of that article in the Internet Archive. The articles themselves are not stored in the online index, so the index doesn't facilitate full text searching of the articles. All you're searching via the index is the text stored in the Topic, Issue, Article Title and Article Author fields. The fields are combined to present search results in a series of rows, each row having a 2-column (Topic / Article) format:

Topic	Article Title – Article Author – (Issue)

The blue colour and underlining of each Article column entry signifies hyperlinking via the Article URL as previously mentioned. If an 'Article Author' is unknown (authorship isn't always explicit in The Communicator) the 'Article Author' field is suppressed in the search results.

Searching by Issue Date

Suppose you remember seeing an article in the January-February 2026 issue of the Communicator, but you can't remember the Article Title or Author and you're unsure what Topic it might be indexed under. Just type 'January-February 2026' in the search box (without the quotes) and you'll instantly get a list of the 37 articles indexed for that issue:

Search the SARC Communicator Archive

January-February 2026
37 results found
Topic
Article
Amateur Radio Television (ATV)
Ham ATV Repeaters On the Internet - Jim Andrews KH6HTV (January-February 2026)
Back to Basics - From the Basic Question Bank
B-007-001-002 - Near Vertical Incident Skywave (NVIS) - John Schouten VE7TI (January-February 2026)
Book Reviews / Newsletters / References
CIDX - The Canadian International DX Club - John Schouten VE7TI (January-February 2026)
Emergency Topics
The story of Salmon, Idaho - Alan Wilson N0XO (January-February 2026)
Emergency Topics
High Water: Ham Radios Role in 2004 Indian Ocean tsunami - Dave Jensen W7DGJ (January-February 2026)
Emergency Topics
A Grab 'n Go Kit - Gord Kirk VA7GK (January-February 2026)
Internet Resources for Hams
Converting the shack computer to Linux WSJT-X - Dan Romanchik KB6NU (January-February 2026)
Internet Resources for Hams
44 Years of 44Net - Dan Romanchik KB6NU (January-February 2026)

Figure 4 Partial list of 37 articles from the January-February 2026 issue retrieved by searching 'January-February 2026'

Note that searching 'January - February 2026' won't retrieve anything because the issue descriptors don't have spaces bracketing the hyphen separator. Use 'January-February 2026'.

Searching "January 2026" won't retrieve anything either because there is no "January 2026" issue. The Communicator became a bimonthly publication commencing with the September-October 2019 issue. Earlier issues can be retrieved by searching a month and year, e.g. "March 2014" retrieves this list:

Search the SARC Communicator Archive

March 2014
10 results found
Topic
Article
Book Reviews / Newsletters / References
War on the Short Waves - (March 2014)
Miscellaneous
The National Radio Quiet Zone - Where There Is No Cell Service - (March 2014)
News You Can Lose - The Lighter Side of Amateur Radio
Use Your iPhone To Send Smoke Signals Even When There Is No Service - (March 2014)
News You Can Lose - The Lighter Side of Amateur Radio
Secret Morse Code Messages Cheer Up Prisoners - (March 2014)
Presentations to SARC members
Getting Started in HF presentation by Stan VA7NF, Brett VE7GM, Jay VE7KC, Al VE7CDC and John VA7XB - (March 2014)
Profiles of SARC Members
Ken Clarke (VE7BC) - Jinty Reid VA7JMR (March 2014)
Propagation
Still Puzzled About HF Propagation? - (March 2014)
Tech - Antennas, Tuners, Launchers, Masts, Rotators, Towers, etc.
The "Best" Random Wire Antenna Lengths - Random wire lengths you should and should not use - Jack Clarke VE3EED (March 2014)
Tech - Arduino & Raspberry Pi
Anyone For A Little Pi? A Low-cost, Amazing Little Computer - (March 2014)
Tech - Electronic Components
Resistor ID Made Easy - (March 2014)

Figure 5 List of 9 articles from the March 2014 issue retrieved by searching 'March 2014'

Maybe you can't remember the exact issue in which an article appeared, but you think it was one of the 2025 issues. Type '2025' into the search box (without the quotes) and you'll get a list of the 237 articles indexed for the 6 issues of the Communicator published in 2025. Scroll through the list to find the article of interest and click its entry in the Article column to open it in your web browser.

Searching by Author

Retrieving articles by author is similarly easy. Can't remember how to spell "McQuiggin"? Try

searching “Kevin” instead. That will retrieve a list of 98 articles (as of the March-April 2026 issue), 91 of which pertain to Kevin McQuiggin (7 articles were authored by other “Kevins”). If you want to restrict the list to Kevin McQuiggin just search his call sign: ‘VE7ZD’ retrieves a list of 91 articles.

But why does searching Kevin’s ‘KN7Q’ call sign retrieve only 88 articles (as of the March-April 2026 issue) instead of 91? The short answer is “because Kevin isn’t the ***author*** of 3 of those 91 articles”. The online index has 4 “Kevin McQuiggin” entries under the topic “Presentations to SARC members” as tabulated below. Such presentations are often mentioned in the “SARC General Meeting minutes” section of the Communicator—the Club’s recording secretary includes a summary of each presentation in the minutes. In such cases the index identifies the recording secretary—not the presenter—as the author. The presenter is instead identified in the ‘Article Title’ index field. The index consistently uses “Kevin McQuiggin VE7ZD / KN7Q (ex K7MCQ)” to identify him ***as an author*** but that’s not necessarily so for article ***titles*** pertaining to him.

Presentations to SARC Members by Kevin McQuiggin	
# 1	GNU radio - building radio circuits on your computer - presentation by Kevin McQuiggin VE7ZD / KN7Q - Jeremy Morse VE7TMY (March-April 2024)
# 2	Introduction to the Arduino - presentation by Kevin McQuiggin VE7ZD - (February 2019)
# 3	Success With FT8 - presentation by Kevin McQuiggin, VE7ZD/KN7Q - Kevin McQuiggin VE7ZD / KN7Q (ex K7MCQ) (May-June 2021)
# 4	GNU radio: Almost Free SDR - presentation by Kevin McQuiggin VE7ZD - (April 2017)

Presentations to SARC Members by Kevin McQuiggin

Notice that Kevin is listed as the ***author*** of only 1 of the 4 tabulated entries, namely # 3. The Club’s recording secretary is listed as the author of # 1. The other 2 tabulated entries (# 2 and # 4) don’t list an author—possibly due to an omission on my part in compiling the index, or possibly because the minutes covering the # 2 and # 4 presentations didn’t explicitly identify the minutes’ author.

In any case, all 4 of the tabulated entries include Kevin’s ‘VE7ZD’ call sign in the ‘Article Title’ index field, so all 4 are retrieved from the index by searching ‘VE7ZD’. 2 of the 4 tabulated entries (# 2 and # 4) do not have Kevin’s ‘KN7Q’ call sign. But, 91 – 2 = 89. So, again: why does searching ‘KN7Q’ retrieve only 88 articles? Since I’ve been contributing to the ‘Profiles of SARC Members’ column, I suspected that the answer had to do with an article profiling Kevin authored by someone else. Sure enough, a quick scroll through the list of 91 articles retrieved by searching ‘VE7ZD‘ reveals ‘Kevin McQuiggin (VE7ZD/K7MCQ) - Robert Fishwick VA7FMR (January 2019)’ under the ‘Profiles of SARC Members’ Topic; this index entry does not have Kevin’s ‘KN7Q’ call sign. So now we have 91 – 2 – 1 = 88. QED.

But wait! There’s more!

Searching either one of Kevin’s ‘KN7Q’ or ‘K7MCQ ‘ call signs retrieves 88 articles (as of the March-April 2026 issue) ***but they’re not the same 88 articles!*** Why? Recall that ‘KN7Q’ appears in 2 of the 4 tabulated ‘Presentations to SARC Members by Kevin McQuiggin’ entries (# 1 and # 3) whereas ‘K7MCQ’ appears only in # 3. That accounts for one difference; the other one being that January 2019 article profiling Kevin: its index entry has ‘K7MCQ’ but not ‘KN7Q’.

Co-Authors are not indexed

Some articles in the Communicator have 2 or more co-authors. For example “Pile-Up Control System (PUCS) - Take control of the pile-up!” at page 40 of the November-December 2025 issue names Sander van der Haar PD9HIX and Erwin Van der Haar PA3EFR as co-authors. To avoid certain database complexities the index lists only one author per article (the first-named author). So, the index entry for the “PUCS” article names only Sander van der Haar PD9HIX as the author of that article. However if you search the index for ‘Erwin Van der Haar’ or for his ‘PA3EFR’ call sign you will get at least one result because Erwin (alone) authored “Fun with Arduino and Semaphore Signaling - Radio Scouting Project” which appears at pages 52-54 of the March-April 2026 issue of the Communicator.

Searching by Topic

As seen in Figures 3, 4 and 5 index search results are returned in a series of 2-column rows headed ‘Topic’ and ‘Article’. The ‘Article’ column is discussed above. In each row the ‘Topic’ column lists 1 of 70 (as of the March-April 2026 issue) topics for each index entry. Again, to avoid certain database complexities, the index lists only one topic per article. If a search turns

up an article which is ‘close’ but not exactly what you’re looking for, try copying the Topic and pasting it into the search box to retrieve the entries for every article indexed under that Topic. Similarly, if a search turns up an article having an intriguing Topic, copy the Topic and paste it into the search box to get the index entries for every article indexed under that Topic.

I hope you find the index useful. Comments and suggestions are welcome: va7bwg@ieee.org

~ Blake VA7BWG

Hamilton Radio Programmer is a software tool designed to simplify the tedious process of programming amateur (ham) radios. While the core functionality of reading, editing, and writing radio channels is free, the Hamilton Pro upgrade unlocks its most powerful feature: the interactive, live Repeater Map.

Traditionally, programming a radio manually or using legacy software requires looking up frequencies, offsets, directions, and CTCSS privacy tones, and entering them line-by-line—a process that can easily drain an entire evening. Hamilton Pro automates this by pulling live, up-to-date data directly from the RepeaterBook directory. When a user opens the Repeater Map and searches for a specific location or radius, the software populates the map with nearby active repeaters. With a single click, users can import all local repeaters directly into their radio's channel list with all technical settings configured correctly.

The software supports 551 distinct radio models from popular manufacturers like Baofeng, Yaesu, Kenwood, Icom, Anytone, Quansheng, TYT, Wouxun, and Radioddity. It utilizes smart band-plan defaults, automatically applying standard offsets when a frequency is typed by hand. Additionally, the application saves the configuration profiles of every connected radio, allowing users to edit channel lists at their convenience and flash them to the hardware later.

While the live Repeater Map requires an internet connection to pull real-time data, the rest of Hamilton's features—including offline reading, local editing, and writing to the radio—function entirely offline. This makes it a reliable utility for field operations or travel. License management is flexible, allowing users to reset their activations online if they switch to a new computer. The software runs on macOS and Windows 10/11 (64-bit), utilizing radio drivers powered by the open-source CHIRP engine.

~ https://autoft8.com/hamilton-pro

The IC-7300, 7610 and 9700

Just how similar are they?

by JOHN SCHOUTEN VE7TI

John Schouten VE7TI

Has both an iCOM 7300 and 9700 and is fascinated by the many features of these transceivers.

The Icom IC-7300, IC-9700, and IC-7610 share a strong family resemblance in core functionality, reflecting Icom's modern SDR design philosophy.

All three transceivers employ Icom's innovative RF Direct Sampling System, where RF signals are directly digitized and processed by an FPGA. This delivers excellent receiver performance, including high RMDR (Reciprocal Mixing Dynamic Range), low phase noise, and clean signal handling across their respective bands. They feature real-time spectrum scopes with high-resolution waterfall displays that allow intuitive touch-screen tuning by simply tapping on a signal of interest.

The user interfaces are deliberately similar, particularly between the IC-7300 and IC-9700, which share nearly identical menu structures, dial and button layouts, and 4.3-inch color TFT touch LCDs for straightforward operation. The larger IC-7610 builds on this foundation with an even bigger 7-inch display while retaining the same intuitive touch-driven workflow. All models support core amateur modes including SSB, CW, RTTY, AM, and FM (with the IC-9700 adding D-STAR DV and DD), along with built-in RTTY decoding,

CW functions like auto-tuning and memory keyers, digital noise reduction, notch filters, and adjustable DSP filtering.

Additional shared capabilities include USB connectivity for PC control and audio I/O (functioning as a sound card), SD card slots for memory storage, logging, and firmware updates, built-in automatic antenna tuners (on the HF-capable models), voice memories, multiple band-pass filters, and comprehensive scanning options. They emphasize clean digital mode integration, audio scopes, and flexible AGC settings, making them versatile for contesting, DXing, digital operations, and everyday ragchewing.

While the IC-7300 and IC-7610 focus on HF/50 MHz (with the 7610 adding true dual independent receivers) and the IC-9700 targets VHF/UHF/SHF (2m/70cm/23cm), their underlying architecture, operational philosophy, and many DSP-driven tools remain closely aligned. This makes them easy to transition between for operators familiar with one model. In essence, they represent Icom's consistent approach to delivering high-performance, user-friendly SDR transceivers across different frequency ranges.

RF Direct Sampling is a key technology in modern Software-Defined Radios (SDRs), notably used in Icom's popular transceivers like the IC-7300, IC-9700, and IC-7610. Instead of using traditional analog mixing stages to convert RF signals down to an intermediate frequency (IF) as in superheterodyne receivers, RF Direct Sampling digitizes the incoming RF signal almost immediately after the antenna and preselector filters, then performs all subsequent processing (filtering, demodulation, etc.) in the digital domain via an FPGA and DSP.

Key Benefits of RF Direct Sampling

- **Superior Receiver Performance and Dynamic Range** — By minimizing analog stages, it significantly reduces noise and distortion introduced by mixers, local oscillators, and multiple IF amplifiers. This results in excellent Reciprocal Mixing Dynamic Range (RMDR) and very low phase noise. For example, the IC-7300 achieves around 100 dB RMDR (typical), a major improvement over previous superhet models.
- **Cleaner Signals and Better Immunity to Interference** — Fewer analog components mean less internal noise generation and better linearity. Strong nearby signals cause less reciprocal mixing, leading to clearer reception in crowded bands—ideal for contesting and DXing.
- **Simplified Architecture and Smaller Size** — Eliminating multiple mixers, oscillators, and crystal filters reduces parts count, complexity, cost, and physical size. This enabled Icom to pack high performance into a compact radio like the IC-7300.
- **Excellent Real-Time Spectrum and Waterfall Displays** — Once the signal is in digital form early in the chain, it's straightforward to implement wideband, high-resolution spectrum scopes (up to 1 MHz span on the IC-7300) and audio scopes with minimal additional hardware. Touchscreen tuning directly on the waterfall becomes intuitive and responsive.
- **Flexibility and Wideband Capability** — Digital processing allows easy implementation of sharp DSP filters, noise reduction, notch filters, and multi-mode operation. It also supports handling multiple bands or wide instantaneous bandwidths more efficiently than traditional designs.
- **Improved Reliability and Consistency** — Fewer analog components reduce points of failure, drift, and manufacturing variations, leading to more consistent performance across units.
- **Enhanced Digital Integration** — Features like built-in RTTY decoding, voice memories, USB sound card functionality, and easy firmware updates become natural extensions of the architecture.

Context: Direct Sampling vs. Traditional Superheterodyne

Traditional superhet receivers use analog conversion stages that can introduce spurs, images, and phase noise. Direct Sampling bypasses most of these, shifting the workload to powerful digital hardware (high-speed ADCs and FPGAs). This approach has become practical for HF/VHF radios as ADC technology has advanced enough to sample directly at RF frequencies with sufficient dynamic range.

Note on Trade-offs: While highly beneficial, RF Direct Sampling requires high-performance (and power-hungry) ADCs, which can challenge thermal design and battery operation in portable rigs. It also demands careful front-end filtering to avoid aliasing. However, for desktop and base-station amateur use, the advantages generally outweigh the drawbacks.

In summary, RF Direct Sampling is a major reason why modern Icom rigs deliver class-leading performance in a user-friendly, compact package—bringing high-end SDR capabilities to a broader audience of radio amateurs.

Yes, there are many significant similarities for operators using the Icom IC-7300, IC-9700, and IC-7610. Icom intentionally designed these radios with a consistent "family" approach, making it easy for operators to switch between them with minimal learning curve.

User Interface and Ergonomics

- **Near-identical layout and menus** — The IC-9700 has an almost identical user interface to the IC-7300. The dials, keys, button placement, and menu screens are very similar, so if you know one, you can operate the other "without hesitation."
- **Touchscreen operation** — All three use intuitive color TFT touchscreens for tuning via the spectrum/waterfall, adjusting filters, accessing menus, and changing settings. The workflow (tapping signals, dragging filters, etc.) feels consistent.
- **IC-7610 differences with similarities** — The IC-7610 has a larger 7-inch display (vs. 4.3-inch on the others) and more physical buttons due to its bigger chassis. However, the menu system, icons, and core touchscreen logic remain very similar to the IC-7300. Operators often note that menus "look and feel the same."

Operating Experience

- Core controls and functions feel familiar across all three: RF gain, squelch, notch, noise reduction/blanker, passband tuning, and mode selection work in similar ways.
- **Spectrum scope and waterfall** — Real-time spectrum display with touch tuning is a shared strength and operates consistently.
- **Digital modes and tools** — Built-in RTTY decoding, CW functions (keyer, auto-tune), voice memories, audio scope, and DSP filtering behave similarly.
- **Connectivity** — USB (sound card + CI-V control), SD card for settings/firmware/logging, and external display options follow the same philosophy.
- **Learning transfer** — Hams frequently report that owning one makes operating the others straightforward. The shared SDR platform and Icom's modern interface design create a unified "Icom SDR experience."

Minor Operational Differences

While the similarities dominate day-to-day use, note these distinctions:

- The IC-7610 offers dual independent receivers, more physical band buttons, and extra ports.
- The IC-9700 adds VHF/UHF-specific features like D-STAR.
- The IC-7300 is the most compact.

Overall, the operator experience is highly transferable. Many users keep multiple models (e.g., IC-7300 + IC-9700 for HF/VHF coverage) precisely because they feel like extensions of the same radio family. This consistency is one of Icom's strengths in this lineup.

~ John VE7TI

Good News for Canadian Radio Amateurs!

On May 11, 2026, Canada's radio regulator Innovation, Science and Development Canada (ISED), released a consultation on their proposals for changes to their policy on antennas and towers. These proposals will speed up and make easier the processes required to get permission to erect antenna systems.

The changes were designed to make things easier for commercial telecommunications providers, but they offer many improvements to Radio Amateurs.

Radio Amateurs of Canada (RAC) and the Fédération des clubs radioamateurs du Québec (RAQI) submitted a joint response to the consultation. In it, we supported all of ISED's proposals for change to this policy.

RAC and RAQI also asked for two changes and two additions to ISED's policy:

- An increase in the exemption from consultation for antenna systems. The current policy makes antennas less than 15 metres exempt from consultation. We would like to change this to 20 metres.
- A decrease in the size of the zone within which Amateurs are required to respond to their neighbours concerns. We requested a decrease to two times the height of the antenna system from the current three times the height.
- Relief from antenna restrictions in "covenants" on residential property
- "Reasonable accommodation" for Amateur Radio antennas for those residing in condominiums, stratas and rented housing.

A copy of RAC and RAQI's response is available in English and French

RAC and RAQI ask all Canadian Amateurs to respond to the consultation in support of our position.

While you are free to write your own letter, RAC has prepared a sample letter in both English and in French that you can simply cut and paste into an email. This will allow you to support our position with just a few mouse clicks. They are provided below.

ISED has requested that all comments be submitted by July 16, 2026, and they will post the comments on their Spectrum Management and Telecommunications website to give others an opportunity to review them. The deadline for replies on the comments of others is August 25, 2026.

Please act now and send your email to ISED at this address:

spectrumoperations-operationsduspectre@ised-isde.gc.ca

More information on the consultation is available at the following links:

- YouTube Interview: Stuart Crawford, VE9CF, interviewed RAC Regulatory Affairs Officer Dave Goodwin, VE3KG, about the proposed changes to the Tower Policy
- ISED consultation: English | French
- ISED current policy: English | French
- The "Regulatory Roundup" column published in English in the May/June 2025 issue of The Canadian Amateur (pages 40-41) provides more information on ISED's current policy – PDF version of column

~ Dave Goodwin, VE3KG

Regulatory Affairs Officer
Radio Amateurs of Canada

regulatory@rac.ca

A True RMS to DC Converter for your DVM

by KEN GRANT VE3FIT

A typical Digital Volt Meter (DVM) found in the ham shack will display AC voltage measurements as Volts RMS (root-mean-square). The RMS value of an AC voltage is equal to the DC voltage providing the same heating power to a load. Note that the assumption with these meters is that the voltage being measured by the meter is a sine wave of a low frequency.

However, if the waveform is not a sine wave, or is of a frequency much above 60 Hz, the displayed value cannot be trusted. What is required is an instrument that displays True RMS. What I have built is a converter module that will allow your DVM to display True RMS values of arbitrarily shaped, repetitive AC waveforms at frequencies up to about 200 KHz (-3 dB at 1 MHz).

Such a waveform is shown in **Figure 1**. This is the actual signal applied to the control grid of a vacuum tube being tested by my old Heathkit TT-1A tube tester. According to Heathkit, it should have a value of 2Vrms (it didn't!). I had no way of accurately measuring this value until I built my converter and was able to adjust the amplitude of the signal for exactly 2Vrms.

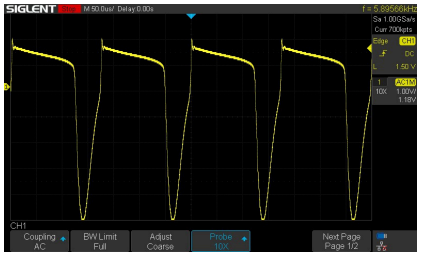


Figure 1: Waveform from TT-1A oscillator

Figure 2 is a photo of the exterior of the device. It's built into a 3" x 3" x 1 ½" plastic box with a 9V battery holder on top. The box was 3D-printed by an unknown person and magically appeared in my junk box 😊. It has a rather ingenious snap-on lid.

The schematic of the converter is shown in **Figure 3**. The AC voltage to be measured is applied to an attenuator, giving ranges of 3, 30 or 300 Vrms with an input impedance of about 900 KΩ. The resistors are surface mount, 1206 size, rated for 1/4W each. The attenuator resistors are mounted on a small printed circuit board. The PCB layout is in a straight line so as to minimize stray capacitance and maximize usable bandwidth.

Figure 2: Exterior view

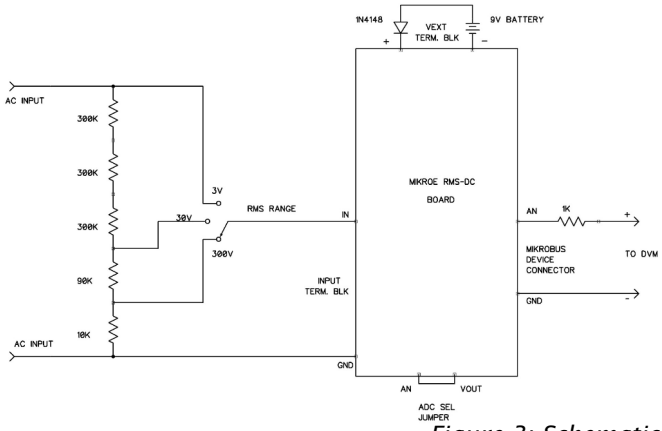


Figure 3: Schematic

The attenuated voltage is applied to the input of a MIKROE RMS To DC 2 Click add-on circuit board. Mikroe (www.mikroe.com) is a Serbian company. The board is available from DigiKey (p/n 1471-MIKROE-5821-nd). The data sheet can be downloaded from DigiKey.

The heart of the Mikroe board is an Analog Devices AD8436 True RMS to DC Converter chip (www.analog.com). It is physically quite small, and the chip leads are very small. Buying the

board with the chip, supporting components, terminal blocks etc., already installed made the most sense to me.

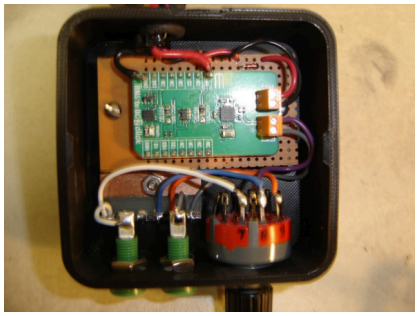


Figure 4: Interior view

The board also has an analog-digital converter and a power-on LED. These components are not used in this application.

Figure 4 is a photo of the interior of the case showing the boards, rotary switch and wiring. The Mikroe board is soldered to a piece of VEROBOARD (perf board) for mounting in the case.

In the very centre of the board, there is a jumper for ADC SELection. It must be moved to the left in order to route the output of the AD8436 to the AN header pin on the MIKROBUS DEVICE CONNECTOR. This connector is dimensioned on a .100" grid.

I later added a 1KΩresistor in series with the output to the DVM for short-circuit protection.

Using the device is straightforward. Turn on the DVM, set for DC volts. Connect the converter output leads to the DVM input. Set the RMS Range switch to the 300V setting. Connect the 9V battery. The DVM reading will kick upwards momentarily and then settle down to read zero.

Connect the voltage to be measured to the converter's AC input terminals and select the most appropriate range.

- Using the 3V range, the converter outputs 1Vdc per Vrms of input.
- Using the 30V range, the converter outputs .1Vdc per Vrms of input.
- Using the 300V range, the converter outputs .01Vdc per Vrms of input.

If you have a waveform generator, you can use it to verify the True RMS values of common waveforms:

- The RMS value of a sine wave is .707 of the peak value.
- The RMS value of a square wave is 1.00 of the peak value.
- The RMS value of a triangle wave is .577 of the peak value.
- The RMS value of a rectangular wave is .500 of the peak value.

The Analog Devices data sheet has an excellent section explaining RMS.

I hope that you will find this device a useful addition to your test bench.

~ Ken VE3FIT

ve3fit@myrac.ca

Volcanic Activity in the Crater at Saint Helens
(with Ham Radio Operations - click on the photo below)

The International Space Station

A review of Amateur Radio operations

by JOHN SCHOUTEN VE7TI

A practical look at equipment, operating technique, and propagation factors behind successful ISS voice contacts

Amateur radio aboard the International Space Station traces its roots to the ARISS program, established in 1996 when amateur radio organizations from the ISS partner nations agreed to place ham equipment on the station for education and public outreach. The first gear was installed in November 2000, and the station went on the air on November 13 during Expedition 1. Commander Bill Shepherd and cosmonaut Sergei Krikalev made the first contacts, reporting excellent VHF signal quality. Since then, the station has evolved from the original Ericsson handheld and later Kenwood radios in the Russian segment to today's Interoperable Radio System (IORS), installed in the Columbus module in 2020. The current system supports voice repeater operation, packet radio, and SSTV image transmissions. Astronauts and cosmonauts now hold amateur licenses, using the station for scheduled school contacts as well as occasional casual QSOs with operators on the ground. ARISS continues to inspire students and radio amateurs alike, keeping the tradition of space-to-Earth communication very much alive.

Operational Note: Doppler Shift

The Doppler effect is one of the central operating considerations in ISS work, particularly on the VHF and UHF frequencies used for voice, repeater, packet, and SSTV activity. Because the station travels at approximately 17,500 mph (28,000 km/h), the apparent frequency of both transmitted and received signals shifts noticeably throughout each pass.

How it works in practice

As the ISS approaches, received signals sound slightly high in frequency. At closest approach, the shift passes through zero. As the station recedes, the signal moves lower. On the 2-meter downlink, such as 145.800 MHz, the total shift across a pass is commonly about ±3 to 4 kHz. On 70 centimeters, such as the 437.800 MHz repeater downlink, the shift is larger, often on the order of ±9 to 10 kHz.

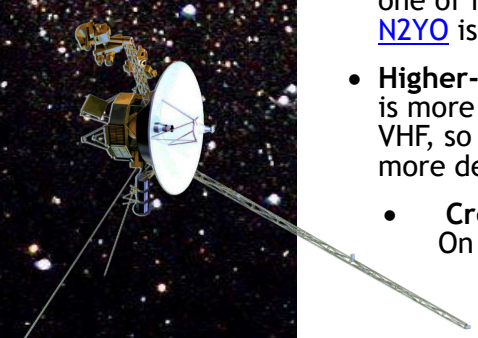
Transmit, receive, or both?

Doppler shift affects both transmit and receive, although most operators notice it first on the downlink. In practice:

- **Receive** (downlink): The signal from the ISS drifts during the pass. Operators typically tune slightly higher while the station approaches and step lower as it recedes in order to keep the signal centered in the receiver passband.
- **Transmit** (uplink): The uplink is shifted as well. In repeater or voice operation, experienced operators may also offset their transmit frequency so the signal arrives closer to the ISS receiver's nominal frequency. In a full-duplex setup, this is easier to manage because you can hear your own signal returning on the downlink.

Practical operator guidance

- **Simple setups**: Handhelds and mobile rigs can succeed by staying near the nominal frequency and relying on FM capture, especially on strong passes. See Clint K6LCS's website for detailed instructions.
- **Tracking tools**: Satellite-tracking software and frequency charts make Doppler correction much easier, particularly on the 70-centimeter downlink. Try Skyroof, it is free and is easily paired wiith an inexpensive SDR dongle to provide a waterfal display as one of its many features. On the web, N2YO is another excellent resource.
- **Higher-frequency sensitivity**: Doppler is more pronounced on UHF than on VHF, so retuning must be faster and more deliberate.
- **Cross-band repeater operation**: On the 145.990 MHz uplink with 67 Hz tone and 437.800 MHz downlink, careful downlink tuning is often the key to hearing both other operators and your own returned audio.



Failure to account for Doppler can make signals sound distorted, drift out of the receiver passband, or disappear entirely during a pass. For many operators, mastering Doppler correction is one of the first real lessons in ISS operating. Accurate tracking, concise operating technique, and frequency agility often matter more than power output or antenna size.

Some of the most memorable ISS contacts have been made with surprisingly simple stations. Patrick WD9EWK logged his first ISS QSO in December 2005 using an Icom handheld and a telescoping whip antenna outside his office in Phoenix, working astronaut Bill McArthur. He later refined his setup with a small directional antenna and added more space contacts, eventually working astronaut Nichole Ayers KJ5GWI, during ARRL Field Day on June 29, 2025. I first worked the ISS and astronaut Reid Wiseman KF5LKT during Field Day 2014. W0PV managed an unexpected mobile contact while driving, using only a handheld and a small mag-mount antenna. KF4UGA worked Richard Garriott with a more capable home station, while W7BAZ finally completed a long-awaited ISS contact after years of near misses. Taken together, these accounts reinforce a familiar lesson in satellite operating: timing, technique, and knowing when to call often matter more than brute-force hardware.

For operators hoping to try it themselves, the practical advice is simple: track the pass carefully, listen first, compensate for Doppler, and keep transmissions brief. Full-duplex operation can be a major advantage because hearing your own signal return from orbit confirms that the path is open. Even so, many successful contacts have been made with nothing more than a handheld radio and a small antenna. That remains part of the appeal. The ISS brings together orbital mechanics, operating skill, and the enduring excitement of making a rare contact. Whether the station is worked with a mobile whip, a handheld beam, or a well-equipped home setup, the opportunity is real. When it rises above the horizon, the window opens briefly—and closes just as quickly. Be ready.

~ John VE7TI

Check out the post on QRZ at: https://forums.qrz.com/index.php?threads/trials-errors-72-greetings-from-outer-space.978955/

Amateur Radio Goes Hollywood (…ish):

Supporting the Tom Green Farm Show

by CRAIG DELMAGE VE3OP

When most people think of amateur radio, they picture a cozy and dimly lit shack, glowing radios, various signals, and a cup of coffee that has gone cold during a long rag chew. What they do not picture is a comedian turned farmer, a television crew, and four amateurs sweating through a hot August afternoon, avoiding mosquitos and ticks, while trying to make HF look glamorous in a hay field.

But that is exactly where we found ourselves last summer—on Tom Green's beautiful farm in eastern Ontario - supporting a new CRAVE TV original series called The Tom Green Farm. The show began airing recently, and our segment appears in Episode 4. What started as a simple inquiry turned into weeks of planning, scripting, equipment wrangling and practicing, and one very memorable day of filming.

How It Started: "We Want the Zany Stuff"

Fresh off a radio related production at the National Arts Centre, I was contacted by the show's producer looking for help in showcasing amateur radio. Tom Green—yes, that Tom Green—the iconic Canadian comedian, television host, actor, rapper, musician, director, producer, podcaster, and recent farmer, who wanted to highlight the quirky, adventurous, eyebrow raising sides of the hobby. Not just "talking on a radio," but the things that make non hams say, "Wait… you can do that?"

Over several weeks, I collaborated with the producer to develop a detailed script, plan, and budget. I proposed seven demonstrations, each with a few "zany" ways that Tom could participate—everything from building a CW key out of scrap metal, talking on a Hollywood California digital talkgroup, to launching a "Tom Green" pico balloon that could be tracked by Tom's fans around the world.

Our proposed demonstrations included:

- VHF/UHF communications (simplex, mobile, APRS, repeater, digital)
- HF voice and CW
- HF digital modes (e.g. FT8)
- Satellite communications
- Fox Hunting
- Parks on the Air (POTA)
- Pico ballooning

We also planned a "barn interview" with Ante, VA2BBW, our colourful amateur host. It was ambitious, but the goal was to give the production team options. Television, however, has its own gravitational pull —schedules,

budgets, and daylight hours have a way of reshaping even the best laid plans.

In the end, we were allotted time for two topics: satellite and HF communications. Not the full buffet, but still enough to highlight the excitement of the hobby.

The Team and the Gear

Our small but mighty crew consisted of:

- Craig Delmage, VE3OP – Team lead
- Mike Kelly, VE3FFK – Antennas
- Greg Danylchenko, VE3YTZ – Jack of all trades
- Ante Laurijssen, VA2BBW – Amateur operator

Between us, we brought enough equipment to outfit a Field Day site, a DX-pedition, and a small lunar outpost. Radios, accessories, antennas, satellite gear, tripods, batteries, cables, backup cables, and backup backup cables. If it fit in one of our vehicles, it came with us. We were also gratefully supported by several amateurs that provided advice and guidance, helped prep Ante on equipment operation, and loaned us needed gear.

The television crew seemed to be both impressed and mildly alarmed yet genuinely interested. Several of the crew approached me asking how to become licenced.

A Hot Day on the Farm

Filming day arrived with the kind of heat that makes coax feel like a garden hose left in the sun. The farm was buzzing—three camera operators, a sound tech, a guest (Glenn Humplik, Tom's long suffering sidekick from the MTV days), and Tom himself, who was genuinely curious about amateur radio.

We set up in an open field—great for camera angles and backgrounds, not so great for shade. The radios performed flawlessly; the operators… slightly less so. Hydration became a tactical priority.

The atmosphere was relaxed and fun. We were surrounded by well-loved horses, donkey, chickens, guinea hens, and Charlie the dog. Tom asked thoughtful questions, cracked jokes, and genuinely wanted to understand how and why amateur radio works. His reactions to HF propagation and satellite tracking were exactly

hat you would hope for: a mix of fascination and "you've got to be kidding me!" As you will see in the episode, he got a little zany on HF. Pity those amateurs on the other end.

Satellite Communications: Space Meets the Farm

Using a camera tripod, a handheld Yagi, a handheld, and a mobile app, we demonstrated how to track and work amateur satellites. We calculated days in advance that we would only get one shot at the International Space Station (ISS) repeater - and Ante, after days of practice, nailed it!

The pass cooperated, the contacts were solid, and the TV crew loved the idea that we were bouncing signals off a spacecraft while standing in a hay field. Tom's reaction to the concept of "the ISS flying over his farm" was priceless.

HF: The Magic of the Ionosphere

Next up was HF. Television loves visuals, so we leaned into the drama—spinning dials, launching antennas, demonstrating CW instruments, and listening for distant stations. The crew captured it all, including the moment Tom realized the voice coming through the speaker was thousands of kilometres away.

What Didn't Make It On Camera

Television time is limited. Although we had prepared demonstrations for fox hunting, digital modes, POTA, and a general interview with Ante, none of those made it into the shooting schedule. That's showbiz.

The good news: the show now understands just how deep the rabbit hole goes. We were told that there's a chance we will be invited back for Season 2 to undertake our other ideas. We are ready.

Why This Matters

Opportunities like this are rare. Amateur radio seldom gets television exposure, and when it does, it is often a background prop or a misunderstood plot device. This project gave us a chance to present the hobby accurately and enthusiastically to a national audience, and in a way that might spark curiosity in viewers who have never heard of HF, satellites, or even amateur radio itself.

If even one person, out of CRAVE's five million viewers, watches the segment and thinks, "That looks fun—I want to try that," then the planning, the sweat, sunburn, and insects were all worth it.

Closing Thoughts

Our thanks go out to Tom Green, Grace the Producer, the on-site television crew, the postproduction team, and everyone else who helped make our efforts a success. It was a unique experience, much fun, and a reminder that amateur radio still has the power to surprise and inspire.

If you ever find yourself lugging an HF radio across a farm field in thirty two degree heat, just remember, it's all part of the amateur radio adventure.

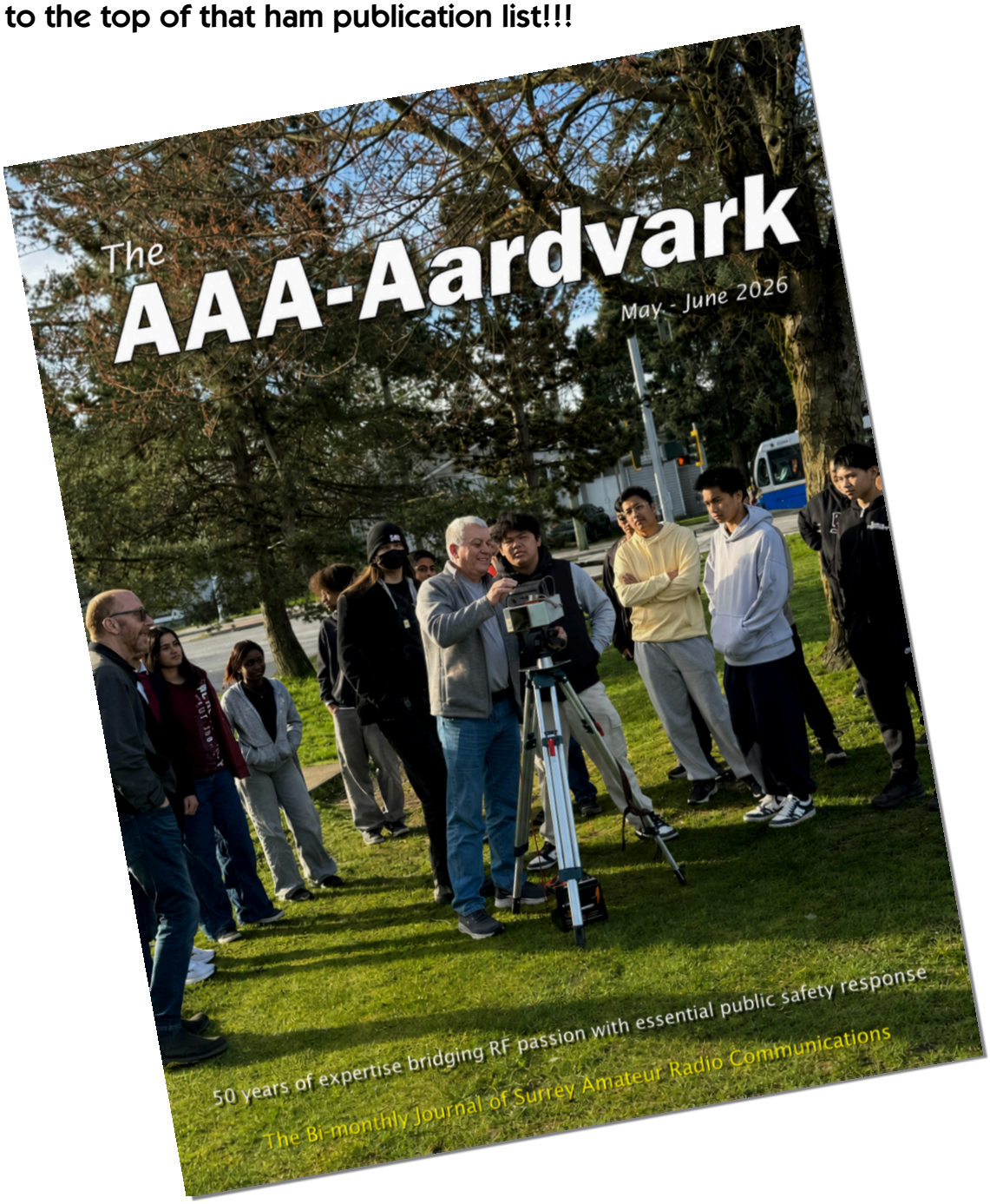
You can watch The Tom Green Farm on Crave TV (Episode 4), and catch additional clips on Tom's YouTube channel:

- https://www.crave.ca/en
- https://www.youtube.com/tomgreen
- https://en.wikipedia.org/wiki/Tom_Green
- https://www.tomgreen.com/
- A clip https://youtu.be/l6XJMMjFswI

73

~ Craig VE3OP

Let's get to the top of that ham publication list!!!

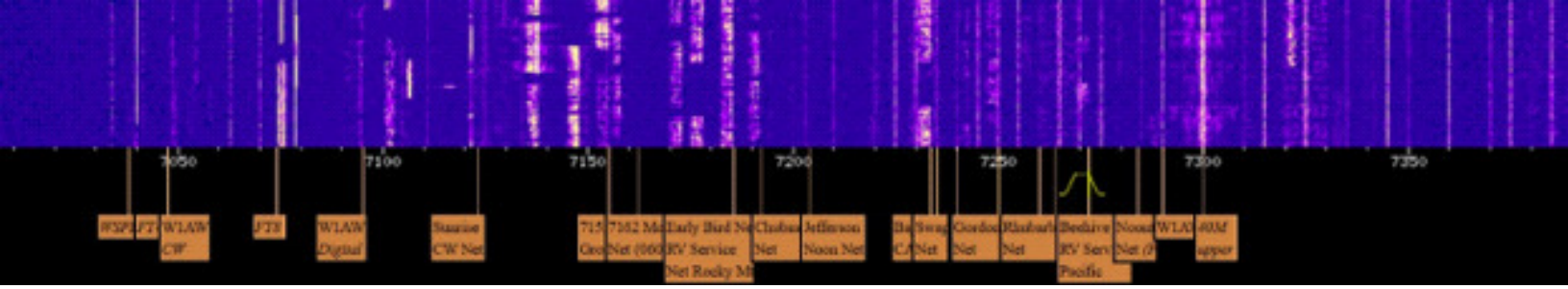

The
AAA-Aardvark
May - June 2026
50 years of expertise bridging RF passion with essential public safety response
The Bi-monthly Journal of Surrey Amateur Radio Communications

"Amateur Radio Weekly" had an article that listed the "best" online amateur radio publications. "The Communicator" was second on the list. I told John VE7TI, but then noticed that the author had just listed the publications alphabetically, not by merit.

The top one was (I forget exactly) something like "The Brisbane Ham Bulletin", but it just happened to be before "C" alphabetically.

John said "maybe we should change the name" of The Communicator, and I suggested a name that would be first in the alphabet, "AAA-Aardvark". For effect I had ChatGPT modify a Communicator cover…

~ Kevin VE7ZD / KN7Q



Wider Sideband SSB?

Try eSSB

by DANIEL ROMILA VE7LCG

I wanted to write a longer article, but this subject came to a quick end for me after several similar experiences. Let me describe the latest one.

It was late Sunday evening, and I was exploring the 40-meter band on my SDR transceiver, a Yaesu FT710. I had followed the procedure required to enable the maximum 4 KHz bandwidth (it involves entering the service menu). The band scope was mirrored on a larger monitor, making it easy to see the waterfall and how much bandwidth each station occupied. Utah WebSDR also has a useful band scope and allows adjustment of the received bandwidth. I stopped on 7.196 MHz and listened to an American station.

It was not the first time I had had a QSO with this group. The main station was fading in and out. On the waterfall, I could see that he was using a constant 6 KHz bandwidth, so this was eSSB: a form of SSB in which the transceiver hardware is modified to transmit more than 3 KHz of audio bandwidth. I joined the conversation.

He confirmed that he was indeed using eSSB, transmitting lower-sideband SSB on the 7 MHz band with 6 KHz bandwidth instead of the usual 3 KHz. Overall, he did not sound very good, although there were moments when his signal came through clearly. My receiver, however, was still set to 2.7 KHz, completely independent of his 6 KHz-wide transmission, and the stations transmitting normally—with around 100 Watts and 3 KHz bandwidth—sounded better and more consistent. I widened my Rx bandwidth to the maximum available on the Yaesu FT710, 4 KHz, and removed the audio cut-off filters. At that point I began to have difficulty understandin him, because I also began hearing all the noi the building: the fans, the high-frequency equipment used by nearby restaurants against rodents, and some LED installation my neighbor has.

I told the American station transmitting at 6 KHz, and a second station transmitting at 4 KHz, that their audio—or rather, the audio reaching me from a little more than a thousand kilometers away—was not that good. They told me they were running around a kilowatt of power. The station using 4 KHz sounded a little better than the one using 6 KHz. My receiver was wide open at 4 KHz, yet I still had trouble understanding them. When I moved back to my 2.7 KHz Rx setting, the conversation became acceptable again, though still not as good as with their colleagues running only 100

Watts, with that power concentrated in 3 KHz bandwidth or less and with microphone audio settings intended for normal bandwidth. Pushing the signal into 4 KHz or 6 KHz really requires a matching wide Rx bandwidth rather than a normal narrow one.

If I had been across the street from the eSSB operators, I probably would have appreciated the enhanced audio quality that comes from increasing transmit bandwidth. By the way, none of them started to sing, so they were not producing anything beyond the usual male voice range.

When adopting commercial radio bandwidth, you start having commercial radio problems.

Commercial broadcasters can support wide audio in part because they have enormous power reserves. Voice of America transmits between 100 kilowatts and 1.5 megawatts. Radio France International has used 10-megawatt transmitters. Radio amateurs, by contrast, are limited in the power we can use. A clean, wide eSSB signal may leave the transmitter sounding impressive, but it still has to travel a thousand kilometers to reach me in a dense urban environment and overcome my local radio noise. The wider I open the Rx bandwidth, the more noise I invite in.

Unfortunately, that kilowatt of eSSB power, spread across a wider bandwidth and forced to compete with local noise from all directions, does not arrive any more intelligibly than 100 Watts concentrated into 3 KHz or less—at least not at my location, with my equipment.

That was the end of the eSSB question for me. There is nothing wrong with experimenting, but eSSB is not for me. Operators in the countryside, or in wilderness locations where radio noise is lower, might have better results. I underline that this is only my own experience, in my own location: a small apartment in an apartment building, with plenty of electrical noise simply from living in a high-density area.

I raised this point with the two radio amateurs using eSSB, both in conversation and later by email: a radio communication chain has 2 parts, the Tx and the Rx. They focus on the Tx and push better quality out. But the Rx has to match that bandwidth if the intended quality is to be heard. If they set their Tx for 6 KHz and I keep my reception at 2.7 KHz, the result is already worse than if the entire chain is matched at 2.7-3 KHz, Tx and Rx together.

The moment I widen my Rx bandwidth to take advantage of their broader Tx, I also open the door to all the noise generated by the building and the surrounding city—noise stronger than whatever is still arriving from their 1 kilowatt. Not only do I fail to get better signal quality, but I also understand them less well. Other radio amateurs may have different results with eSSB, and much depends on location and the local noise floor.

The two colleagues have not yet answered my point that the Rx needs to match the Tx bandwidth, and that widening the Rx bandwidth degrades their signal at my end rather than improving it. Unlike commercial stations, they cannot simply solve that problem with megawatts.

I was disappointed by eSSB again, although I genuinely wanted to like it, and I felt some pressure from the eSSB group to say that their audio was far better than normal SSB. That was not my experience on my transceiver or on the WebSDRs I listened to. Every time the receiver bandwidth was extended, the added noise offset whatever gain in audio quality might have come from increasing the transmitted audio bandwidth from 3 KHz to 4, 6, or even 8 KHz. To be honest, all the transmissions I heard were male voices, so there was not much more to be conveyed above 3 KHz anyway.

Somehow, I remember that this Rx noise problem was exactly why we arrived at SSB in the first place, and at 2.7 and 2.4 KHz filters. But never mind—I will not insist further. Experiments are fine, and I have nothing against them. There are very few radio amateurs on the bands anyway, so there is plenty of room for everybody, with eSSB or not. Still, my particular experience of living in an apartment building, in a noisy environment, leaves me with little interest in eSSB. I suspect many people nowadays are in the same situation.

It would be more interesting to write about ISB. ("Independent Sideband (ISB) stereo is an AM stereo technique that transmits the left audio channel on the Upper Sideband (USB) and the right channel on the Lower Sideband (LSB) of a single carrier. Primarily championed by Leonard Kahn in the 1980s, it allows high-fidelity, independent information on each sideband. While theoretically sound, it faced challenges with receiver availability and stereo separation at high frequencies." – quoted from Google AI search)

For those who still want to learn more about eSSB, the website essb.us is a useful source. As a word of caution, radio amateur transceivers have always worked better, more safely, and more reliably when used as their manufacturers designed and intended, not modified.

~ Daniel VE7LCG

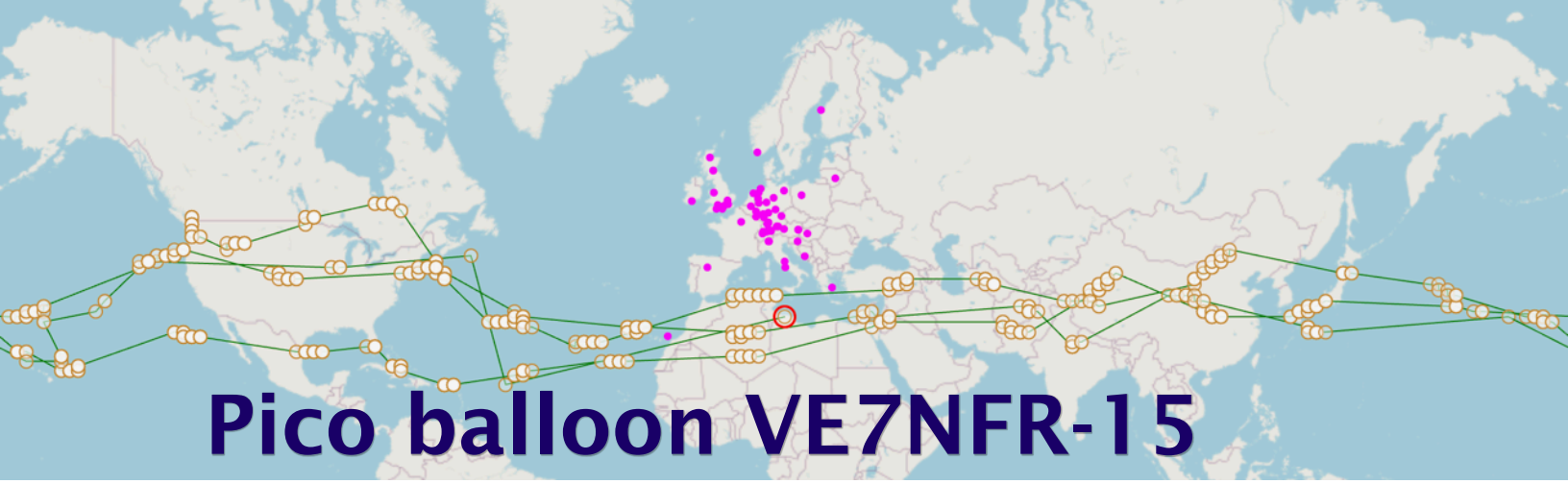
Reviving Teletext for Ham Radio

by STEPHEN CASS - IEEE Spectrum

Once upon a time in Europe, television remote controls had a magic teletext button. Years before the internet stole into homes, pressing that button brought up teletext digital information services with hundreds of constantly updated pages. Living in Ireland in the 1980s and ’90s, my family accessed the national teletext service—Aertel—multiple times a day for weather and news bulletins, as well as things like TV program guides and updates on airport flight arrivals.

It was an elegant system: fast, low bandwidth, unaffected by user load, and delivering readable text even on analog television screens. So when I recently saw it was the 40th anniversary of Aertel’s test transmissions, it reactivated a thought that had been rolling around in my head for years. Could I make a ham-radio version of teletext?

~ https://spectrum.ieee.org/reviving-teletext-for-ham-radio



Pico balloon VE7NFR-15

Our VE7NFR-15 pico balloon is alive but not well. We broke our previous record of 2.5 circumnavigations and, as of late June, have completed 3 laps and was last heard from yesterday over Libya on lap 4.

It has been aloft 59 days and travelled over 126000 km since its launch at Kwantlen Park High School!

However, it has suffered either an antenna problem or degradation of the solar panels as we typically are only getting a transmission once a day and sometimes not for several days.

The SondeHub site we shared with you previously only updates when two consecutive reliable transmissions are received.

Instead of SondeHub, you may want to look at this site, which tracks location even when we have just a single signal received:

https://traquito.github.io/search/spots/dashboard/?band=20m&channel=536&callsign=VE7NFR&dtGte=2026-04-02

If you scroll down on that site you will also see when the last signal was received.

In other news, preparations are about to begin in July for the next high altitude balloon launch which will likely take place in August or September.

We will send another update with those details when we have identified a target launch date.

~ 73 from the team… Adrian VE7NZ, Scott VA7SL, Keith VE7KW, Thomas VE7TOA, Steve VE7RW.

Digital Library of Amateur Radio and Communications

What's New at DLARC — June 2026

by KAY SAVETZ K6KJN [via the Zero Retries Newsletter]

Greetings from DLARC World Headquarters, where I still have a stack of business cards from Hamvention to sort through. Your free online radio library has added a massive amount of reading material since my last update. Whether it's for casual reading or deep research, you're sure to find something of interest in the stacks.

First, an update: In April, I mentioned the addition of many public domain issues of CQ Amateur Radio to DLARC, but listed a bunch of issues that we lacked from that publication's first four years. Daniel Bateman KK4FOS, at Buckmaster International / hamcall.net, stepped up with the digital goods, delivering all of the missing issues! Now DLARC has a complete set of CQ from its first issue in 1945 through 1963. (A bit of free advertising: If you need issues from 1964 through 2022, HamCall's CQ Magazine Archive is the only legit place to get them.)

In addition, DLARC has added a new collection of Review of International Broadcasting newsletters. Review of International Broadcasting was a newsletter devoted to the shortwave listening hobby, covering notable content heard on the air, news about legitimate broadcasters and pirate radio stations, program schedules, and radio hardware tips. The new collection includes 107 issues published from 1978 through 1997. 83 of those issues are new to DLARC, thanks to a box of issues generously sent by the publisher, Glenn Hauser.

We've added many other electronics and communications magazines to the library as well including 146 issues of Electrical Communication, from issue one in August 1922 all the way through 1961. It began as the journal of the International Western Electric Company, passed through being called the journal of the International Standard Electric Corporation, and ended in 1961 as the technical journal of the International Telephone and Telegraph Corporation. The entire time, though, it was a fascinating journal of "progress in the telephone, telegraph and radio art."

We've added 565 issues of Electronics magazine, from the first issue in April 1930 through the end of 1961. It covers all aspects of electronics, and there's lots and lots of amateur radio content. 1946: The Collins 30K transmitter, 1956: An SSB station in a train car.1961: Hams orbit their own satellite.

Also, a collection of 60 issues of Electronic Servicing (well, technically it's called "P.F. Reporter Including Electronic Servicing" — rolls right off the tongue, doesn't it?) spanning 1961 through 1967. It was a trade journal covering electronic equipment maintenance, published by Howard W. Sams. Some fun amateur radio content is buried in these pages.

We've added 26 issues of FM Bulletin, which was a magazine chronicling early amateur FM on VHF/UHF, was published from 1967 to 1969. Edited by Ken Sessions K6MVK and Mike Van Den Branden

WA8UTB, it was renamed to FM Journal sometime in 1968. These scans are courtesy of Florida Amateur Spectrum Management Association.

DLARC has added a small collection of historical documents from the Case Amateur Radio Club (W8EDU) at Case Western Reserve University in Cleveland, Ohio. The club was founded at the Case Institute of Technology in the 1940s. And, we have a new Texas A&M University Amateur Radio Club (W5AC) collection, including newsletters, QSL cards, meeting minutes, and meeting slides. Founded in 1912, W5AC is one of the oldest student organizations at Texas A&M University, and is one of the oldest university radio clubs in existence.

In a post-Hamvention frenzy of reaching out to many many ham clubs, DLARC has added newsletters from many regional ham radio groups: the Vaca Valley (California) Radio Club, the East Greenbush (New York) Amateur Radio Association, the Peekskill/Cortlandt (also New York) Amateur Radio Association, the Northern Ohio Amateur Radio Society, the Radio Association of Erie (Pennsylvania), the Ole Virginia Hams (in Virginia, obviously), the Rockford (Illinois) Amateur Radio Association, and the Cuyahoga Amateur Radio Society (in Independence, Ohio).

If I was giving out awards for these clubs (which I not! We don't play favorites!) they would be to Ole Virginia Hams for sheer number of newsletters to archive — 472; to Cuyahoga for best newsletter name — "Wobbly Oscillator"; and to Rockford for uploading 360 newsletters all on their own. I was delighted to see them show up at Internet Archive, I simply created a collection for them.

So that's a lot of reading and research material. We'll finish with a treat for your ears: DLARC has a new collection of Amateur Radio News And Notes, a weekly news roundup by Ed Cabic N2EC for the Mount Vernon (Alexandria, Virginia) Amateur Radio Club, covering DX, contests, propagation, club activities, and notable developments across the hobby. Ed's been at it since March 2025, and we have all 62 episodes so far.

Digital Library of Amateur Radio & Communications is funded by a generous grant from Amateur Radio Digital Communications (ARDC) to create a free digital library for the radio community, researchers, educators, and students. If you have questions about the project or material to contribute, contact me at kay@archive.org.

Just some of the material available in the DLARC library

Magazines
73 Amateur Radio Today
Coop's Satellite Digest
DXing Horizons
Florida Skip
Mobile Radio Technology
Monitoring Times
NZART Break-In
Radio & Television News
Radio Craft
RTTY Journal
Telegraphic Journal and Electrical Review
VHF Communications
...and many more

Conference Archives
Comm Academy
Computer Networking Conf.
Digital Communications Conf.
FOSDEM radio presentations
GRCon GNU Radio Conference
HamSCI
International EME Conference
MicroHams Digital Conference
Pacificon
QSO Today Virtual Ham Expo
Software Defined Radio Academy
...and more

Audio
Amateur Radio Newsline
California Historical Radio Society News
Glenn Hauser's World of Radio
International Radio Report
National Radio Club DX Audio Service
RAIN Report

Plus
Historical callbooks
40,000+ newsletters
Radio catalogs
College radio archives
Early Internet ham radio discussions
Robert B. Cooper's personal archives

Johan Heijboer:

‘Warm Electronics’

by JOHN SCHOUTEN VE7TI

On a cold January night in occupied Amsterdam, a radio transmitter crackled briefly to life somewhere behind drawn curtains and blackout shades. Morse signals leapt invisibly into the darkness above the Netherlands, carrying information vital to the Dutch resistance. The transmission lasted only minutes. It had to. Somewhere in the city, German radio detection teams were already listening, their direction-finding equipment sweeping the airwaves for illegal signals. In the hidden room beside the transmitter sat Johannes Pieter Heijboer — known to friends and colleagues simply as Johan — an engineer whose technical brilliance had become one of the resistance’s most valuable weapons.

Heijboer was born on 8 March 1912 in the Zeeland town of Kortgene, long before radio had woven itself into everyday life. He belonged to the first generation to grow up in the age of practical wireless communication, when radio still carried the excitement of discovery and possibility. By the 1930s he had become an electrotechnical engineer at Philips in Eindhoven, one of Europe’s leading electronics firms. Philips engineers lived at the center of a revolution in communications technology. Vacuum tubes, oscillators, receivers, power supplies, and transmission systems were not abstract concepts to them; they were tools of daily work. Heijboer developed a reputation as a disciplined and highly capable engineer, combining technical understanding with a

practical instinct for solving problems.

Those skills would become critically important after May 1940, when German forces invaded the Netherlands. The occupation transformed radio from a commercial and scientific technology into an instrument of survival. Telephones could be monitored. Mail could be intercepted. Couriers could be arrested. Radio alone offered the possibility of rapid communication across occupied territory. Yet clandestine transmission carried enormous danger. German counterintelligence units operated sophisticated radio direction-finding teams that could locate illegal transmitters with alarming speed. A resistance operator who stayed on the air too long risked execution.

Heijboer soon became involved with the Ordedienst, or OD, one of the major Dutch resistance organizations. At first, the underground radio network suffered from serious weaknesses. Equipment varied widely in quality, procedures were inconsistent, and many operators lacked proper technical discipline. Some transmitters were unreliable homemade constructions assembled from whatever components could be scavenged during wartime shortages. Others operated on predictable schedules or frequencies that made them vulnerable to German interception. By 1943, the OD leadership realized the network needed more than courage to survive; it needed engineering.

Heijboer was asked to evaluate the system, and what he found convinced him that the resistance needed an entirely new approach. Rather than patching together isolated stations, he envisioned a coordinated communications network with standardized equipment and more disciplined operating procedures. It was an extraordinarily ambitious project considering the circumstances. The Netherlands remained under occupation. Radio components were scarce and closely controlled. Every resistor, vacuum tube, transformer, and length of copper wire had to be obtained secretly. Workshops had to remain hidden. Discovery meant imprisonment or death.

Yet Heijboer approached the challenge with the calm determination of an engineer solving a difficult design problem. Working with trusted associates, and likely receiving quiet assistance from sympathetic Philips employees, he helped organize the construction of roughly two dozen clandestine radio stations distributed across the country. Some stations included independent generating equipment so they could continue operating even if commercial power failed or became unsafe to use. The transmitters themselves had to be compact, reliable, and simple enough to repair under desperate conditions. They also needed to be concealed quickly if German police arrived unexpectedly.

By 1944 the OD radio service had evolved into one of the most sophisticated underground communications systems in occupied Holland. Messages moved between regional resistance groups and central coordinating stations in Amsterdam and Blaricum. Hundreds of coded telegrams were exchanged with liberated territory and resistance contacts elsewhere in the country. To modern amateur radio operators, the achievement is striking. This was not merely a collection of improvised wartime radios; it was a functioning national communications network built almost entirely in secret.

Heijboer understood something fundamental about clandestine radio: technical success depended as much on operating discipline as on equipment quality. A beautifully designed transmitter could still betray its operator if used carelessly. Transmissions had to remain brief. Frequencies had to change regularly. Antennas had to be discreet. Operators needed training not only in radio procedure, but in survival.

Unfortunately, wartime shortages imposed limits that even Heijboer's ingenuity could not entirely overcome. The OD network lacked sufficient frequency flexibility, and many operators were forced to share the same transmitting channels repeatedly. German monitoring services gradually learned where to listen. Every transmission increased the danger.

One of the most dramatic episodes in Heijboer's wartime story unfolded inside the Amsterdam headquarters station known as "Leidend Station II." The station operated from the home of radio operator Dirk Hulsman, where Heijboer himself was staying. Hidden equipment filled the rooms with the faint smell of warm electronics and solder. Operators worked in silence, fully aware that a single mistake could bring armed police through the door.

By early 1945 German radio surveillance had

intensified across the occupied Netherlands. Direction-finding vehicles patrolled the streets searching for unauthorized signals. The invisible duel between clandestine operators and German detection teams had become increasingly desperate. On 30 January 1945 the Sicherheitsdienst finally struck. Heijboer was arrested, almost certainly after the station had been traced through its radio transmissions.

For ten weeks he remained imprisoned while the war itself neared its end. Allied forces were advancing. German control in the Netherlands was collapsing. Yet even in those final chaotic weeks, executions of resistance prisoners continued. On 14 April 1945, only days before liberation, Johan Heijboer and nine other resistance members were taken to Rozenoord along the Amsteldijk in Amsterdam and executed by German forces. He was thirty-three years old.

The tragedy of Heijboer's death is sharpened by how close freedom had become. The sophisticated communications network he helped create had survived years of occupation and enabled resistance coordination during some of the darkest moments of the war. Yet like many clandestine radio operators across Europe, he ultimately paid with his life for the simple act of transmitting information.

After the war, Heijboer received the Dutch Bronze Lion for bravery, and he was reburied with honor at the Eerebegraafplaats Bloemendaal cemetery. But outside specialist historical circles, his name gradually faded from public memory. Among radio historians and technically minded amateurs, however, his story remains deeply significant.

Heijboer represented a particular kind of wartime heroism rarely celebrated in dramatic fashion. He did not command troops in battle or lead public acts of defiance. His battlefield was the workbench, the hidden transmitter room, and the fragile network of invisible signals moving through occupied airwaves. His weapons were oscillators, vacuum tubes, coded transmissions, and engineering judgment.

For readers of The Communicator, Johan Heijboer's life offers a powerful reminder of what radio has meant throughout modern history. Amateur radio has always been more than recreation. In moments of crisis, radio becomes resilience itself — a technology capable of crossing borders, surviving destruction, and connecting isolated people against overwhelming odds. In occupied Holland, Johan Heijboer - Engineer, Radio Visionary, and Resistance Communicator, transformed technical knowledge into resistance, and in doing so became one of the quiet architects of freedom carried on the airwaves.

~ Compiled from various sources

Spy Tech: A Quiet Radio For Spies

Normally, when you think of a radio transmitter, you want the strongest signal and range. But if your radio operator is secretly operating as a spy, broadcasting their position isn't a feature; it is a liability. This fact didn't escape World War II radio designers.

Read the story: https://hackaday.com/2026/05/20/spy-tech-a-quiet-radio-for-spies/

Using a Quansheng?

Don’t Brick Your UV-K5!

by BLAKE R. WIGGS VA7BWG

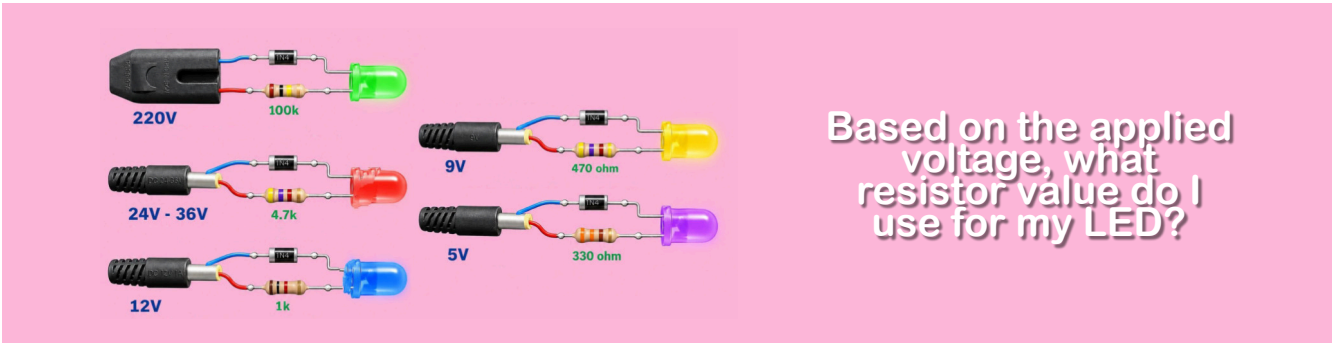
My very first radio was a Quansheng UV-K5. I still have it and use it. I like it so much that I bought another one. Shortly after getting my first one in 2024, I flashed it with the Egzumer firmware which provides a better user interface. After unboxing my second UV-K5 and without thinking, I flashed it with the Egzumer firmware. OOPS! The flashing process halted almost immediately with a cryptic error message and the radio wouldn’t power on. I bricked it! 😟

There are different models of the UV-K5, identifiable by the label inside the battery compartment. My first UV-K5 is labelled “Model: UV-K5”, “FCC ID: XBPUV-K5”; the second one is labelled “Model: UV-K5(8)”, “FCC ID: XBPUV-K5 V3”. Out of the box, my two UV-K5’s are functionally identical, but the one labelled “Model: UV-K5” has the DP32G030 microcontroller unit (MCU); whereas the “UV-K5(8)” has the PY32F071 MCU. Bottom line: Egzumer hasn’t been updated for the PY32F071 MCU.

I was able to unbrick my “dead” UV-K5 fairly easily with Quansheng’s UV-K5/ UV-K5(8) V3 CPS+Upgrade Tool+Firmware Don’t try flashing the downloaded K5ENG_v7.00.15_publish.bin firmware with something like the UVTools firmware flasher though—you need to install and use the QPS-K series radio customer programming software tool included in Quansheng’s download package.

The hacker community is working on a firmware replacement for UV-K5s having the PY32F071 MCU but I’ll sit on the sidelines until my brick-spiked heart rate settles down.

~ Blake VA7BWG



FT8 automation

With the MSHV Program

by DANIEL ROMILA VE7LCG

Before You Begin

In this article, I presume that:

- You already know what FT8 is.
- You have some experience operating FT8, probably with variants of WSJT-X or JTDX.
- You have a modern transceiver with a USB sound card connected to your computer, such as a YAESU FT-710, FT-DX10, ICOM IC-7300, KENWOOD TS-980S, or a similar model.

In the following pages, I will quickly go through the MSHV software and its settings, with the goal of getting you up and running in 20–30 minutes by following this article.

I tried various scripts for automating FT8. They required leaving the FT8 software exactly as they wanted, with its component windows locked into fixed positions on the computer screen. The scripts faked mouse movements and clicks, and in practice they took control of my computer, leaving me unable to use it for anything else. The smallest shift of the FT8 windows from their original position made those scripts stop working. *It is not something I intend to use ever again.*

What Makes MSHV Different

If you have ever seen an FT8 line on your screen involving two separate stations, you have already encountered somebody using MSHV *[see the graphic below]*.

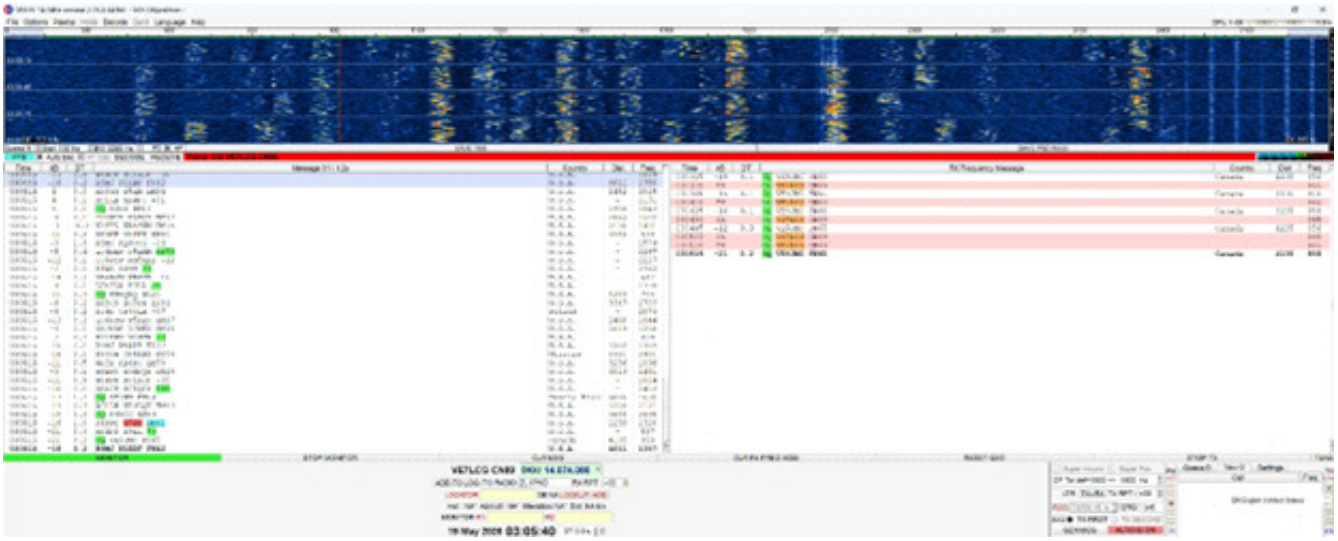
I am VE7LCG. In a single line, I acknowledge the end of communication with N8IH and begin a new communication with KQ4FTM, telling him that my report for him is -18.

The MSHV software is not new. It is simply less well known because it was created by a Bulgarian radio amateur, LZ2HV. His website does not have the most up-to-date certificate accepted by many Windows antivirus or firewall programs, so you will most likely get a warning and have to explicitly decide whether to continue to the Bulgarian website:

https://lz2hv.org/mshv

I decided to continue and ignored the warning. Nothing happened to me—there was no virus warning or anything similar; it was only a notice that the certificate was expired or otherwise not current. Proceed at your own risk.

040115	-6	0.3	VE7LCG	N8IH	EM50			U.S.A.	3539	2900
040115	-18	0.1	VE7LCG	KQ4FTM	EM74			U.S.A.	3507	552
040130	TX		N8IH	VE7LCG	-06					750
040145	-4	0.3	VE7LCG	N8IH	R-03			U.S.A.	-	2899
040200	**TX**		N8IH	RR73;	KQ4FTM	<VE7LCG	> -18			**750**



Installation and System Check

At the time of writing this article, on May 18, 2026, MSHV is at version 2.76.6 and can be downloaded for Windows, Linux, and macOS from: https://lz2hv.org/node/10

I let everything install with the default options. When you start the program, you will see something similar to the following picture on the screen. I say similar, not identical, because your software is not yet set up for your transceiver *[see the graphic above]*.

Let MSHV keep running. First, we have to look at the operating system itself. Your transceiver must be ON, ready to work in FT8 as it already does in other programs, and connected to the computer with a USB cable; the computer must also be ON. For verification, start by opening Control Panel and checking that everything is OK there, with no driver or connection problems. In the Ports section of Control Panel, you should see something like this:

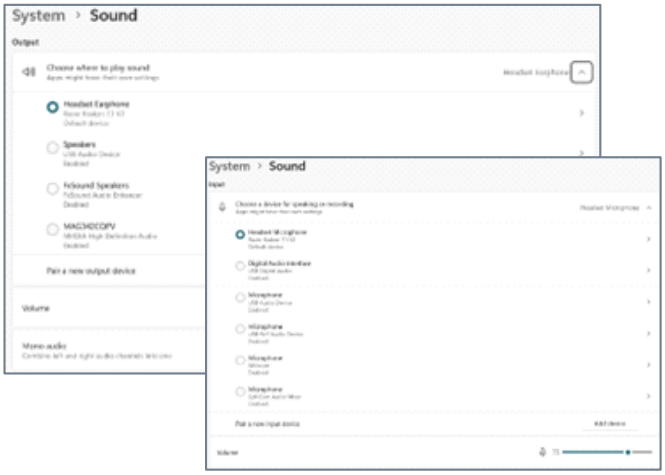
Ports (COM & LPT)
Communications Port (COM1)
Silicon Labs Dual CP2105 USB to UART Bridge: Enhanced COM Port (COM3)
Silicon Labs Dual CP2105 USB to UART Bridge: Standard COM Port (COM4)

Control Panel Ports

The most important thing is that there should be no yellow exclamation mark in Control Panel.

When I connect my transceiver's USB sound card to my computer, and both the transceiver and the computer are ON, I see a new "Speakers – USB audio device" and "Microphone – USB audio device" in System – Sound settings. Your computer should show the same.

The easiest way to confirm this is to look at System – Sound settings first with your transceiver OFF, then turn the transceiver ON and watch those two devices appear:

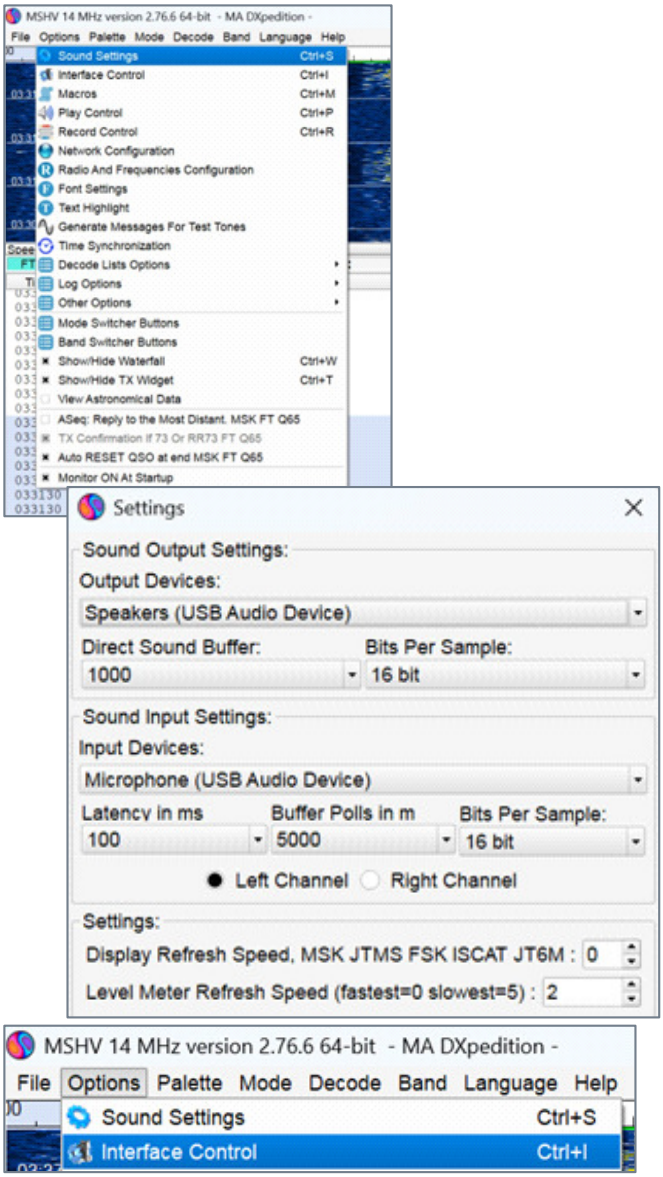


Configuring Audio and Interface Control

Now that we are sure everything is OK in the Windows operating system, we can jump into MSHV and have it working in just a few minutes. Go to Options, then to Sound settings, and set everything as you see in my screenshot *[top of the next page]*.

We have solved the audio IN and OUT for FT8 transmission. Now let's set up the Rx/Tx commands. Go to Options, and from the drop-down menu select "Interface Control."

In the new window that appears, copy everything as I have it.



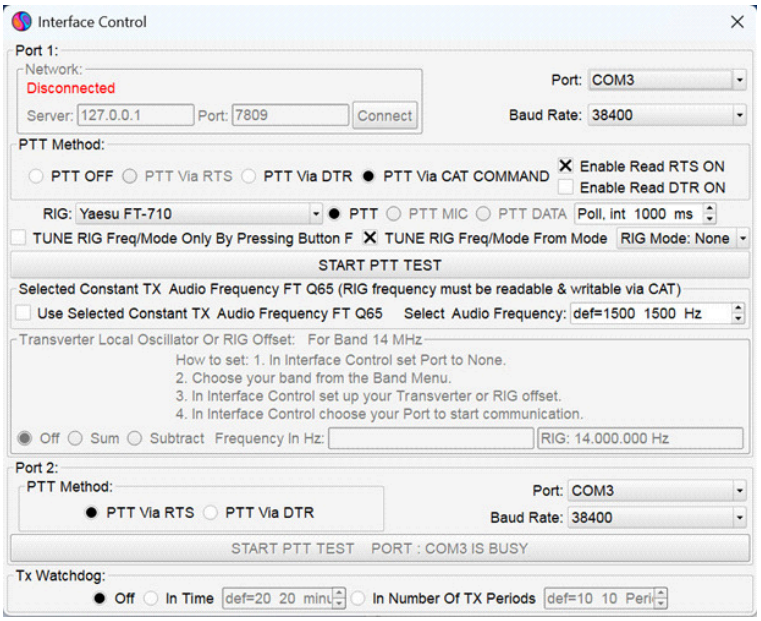
MSHV 14 MHz version 2.76.6 64-bit - MA DXpedition -
File Options Palette Mode Decode Band Language Help
Sound Settings Ctrl+S
Interface Control Ctrl+I

Note: My enhanced port is COM3. The third picture in this article shows what I have in Control Panel under Ports. Your enhanced port may be a different number, so choose that number for the COM port.

Essential Software Options

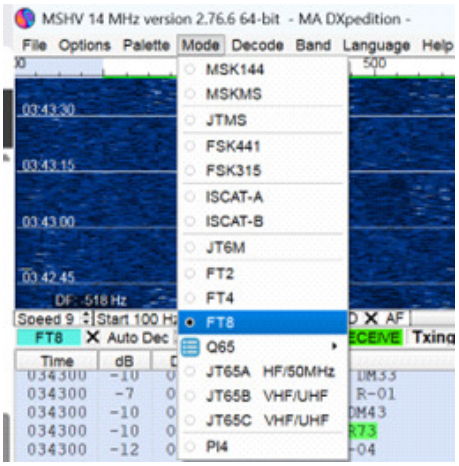
Do not panic if your screen does not show any decoding or reception yet. Everything is fine. My software already has the full setup, not only the steps above, which is why some activity may already be visible in the background.

We set our software to work in FT8 mode and you can see in the screenshot that MSHV already knows the new, faster FT2 mode.


Interface Control
Port 1:
Network:
Disconnected
Server: 127.0.0.1
Port: 7809
Connect
Port: COM3
Baud Rate: 38400
PTT Method:
PTT OFF PTT Via RTS PTT Via DTR PTT Via CAT COMMAND
Enable Read RTS ON
Enable Read DTR ON
RIG: Yaesu FT-710
PTT PTT MIC PTT DATA
Poll, Int 1000 ms
TUNE RIG Freq/Mode Only By Pressing Button F
TUNE RIG Freq/Mode From Mode
RIG Mode: None
START PTT TEST
Selected Constant TX Audio Frequency FT Q65 (RIG frequency must be readable & writable via CAT)
Use Selected Constant TX Audio Frequency FT Q65
Select Audio Frequency: def=1500 1500 Hz
Transverter Local Oscillator Or RIG Offset: For Band 14 MHz
How to set: 1. In Interface Control set Port to None.
2. Choose your band from the Band Menu.
3. In Interface Control set up your Transverter or RIG offset.
4. In Interface Control choose your Port to start communication.
Off Sum Subtract Frequency In Hz:
RIG: 14.000.000 Hz
Port 2:
PTT Method:
PTT Via RTS PTT Via DTR
Port: COM3
Baud Rate: 38400
START PTT TEST PORT : COM3 IS BUSY
Tx Watchdog:
Off In Time def=20 20 min
In Number Of TX Periods def=10 10 Peri

We need to go to “Other Options” several times, because the software lets us click only one option at a time—yes, that is something I would change too.

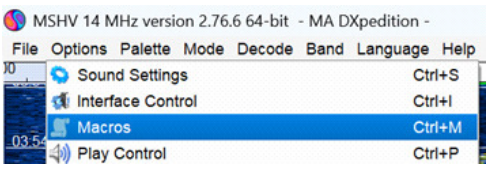
Copy what I have *[right]*.

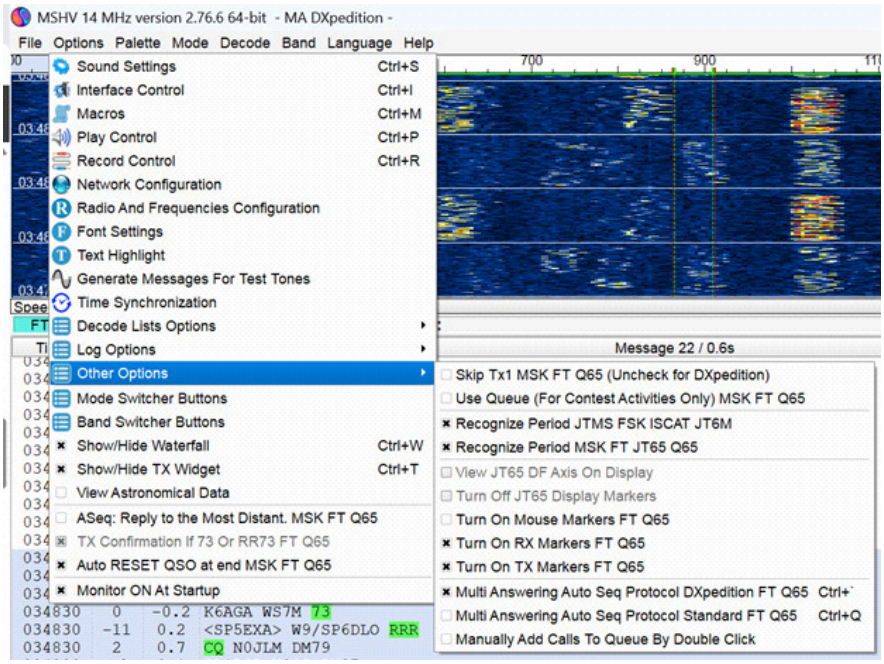


I made a large screenshot *[top, next page]* because you have to check that you indeed have what I have in the left column too, not only under “Other Options.” Pay special attention to “Monitor ON at Startup” being checked in the left column. If you do not check this, you will start the software and nothing will happen. The waterfall will not flow, no signal will be shown as received, and nothing will be decoded.

Macros and On-Air Operation

Now we go to Options, then to the Macros section.


MSHV 14 MHz version 2.76.6 64-bit - MA DXpedition -
File Options Palette Mode Decode Band Language Help
Sound Settings Ctrl+S
Interface Control Ctrl+I
Macros Ctrl+M
Play Control Ctrl+P

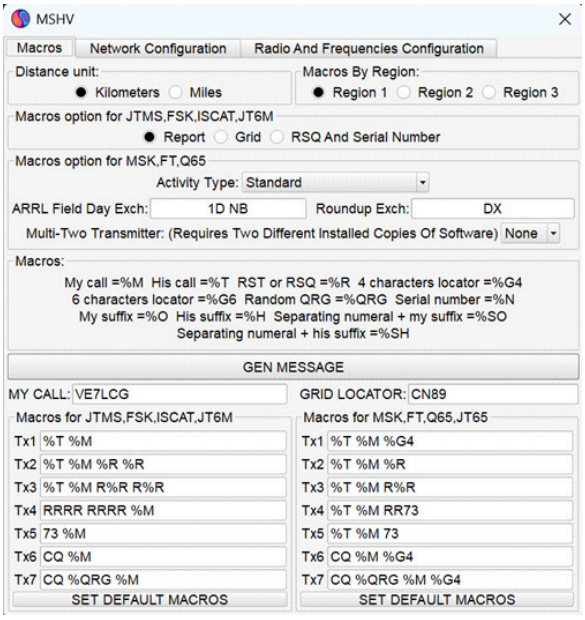

MSHV 14 MHz version 2.76.6 64-bit - MA DXpedition -
File Options Palette Mode Decode Band Language Help
Sound Settings Ctrl+S
Interface Control Ctrl+I
Macros Ctrl+M
Play Control Ctrl+P
Record Control Ctrl+R
Network Configuration
Radio And Frequencies Configuration
Font Settings
Text Highlight
Generate Messages For Test Tones
Time Synchronization
Decode Lists Options
Log Options
Other Options
Mode Switcher Buttons
Band Switcher Buttons
Show/Hide Waterfall Ctrl+W
Show/Hide TX Widget Ctrl+T
View Astronomical Data
ASeq: Reply to the Most Distant. MSK FT Q65
TX Confirmation If 73 Or RR73 FT Q65
Auto RESET QSO at end MSK FT Q65
Monitor ON At Startup
Message 22 / 0.6s
Skip Tx1 MSK FT Q65 (Uncheck for DXpedition)
Use Queue (For Contest Activities Only) MSK FT Q65
Recognize Period JTMS FSK ISCAT JT6M
Recognize Period MSK FT JT65 Q65
View JT65 DF Axis On Display
Turn Off JT65 Display Markers
Turn On Mouse Markers FT Q65
Turn On RX Markers FT Q65
Turn On TX Markers FT Q65
Multi Answering Auto Seq Protocol DXpedition FT Q65 Ctrl+`
Multi Answering Auto Seq Protocol Standard FT Q65 Ctrl+Q
Manually Add Calls To Queue By Double Click
034830 0 -0.2 K6AGA WS7M 73
034830 -11 0.2 <SP5EXA> W9/SP6DLO RRR
034830 2 0.7 CQ NOJLM DM79

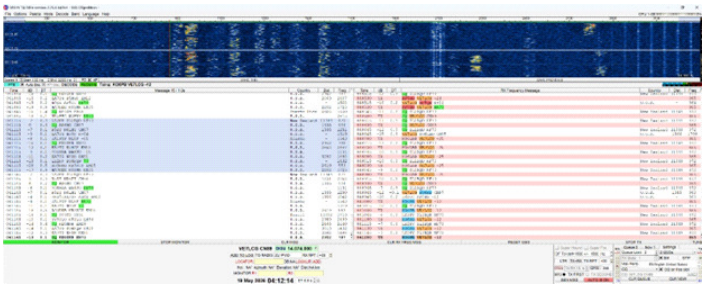
Copy the settings as I have them. You might need to press some tabs to see what I have in the screenshot.

What you see there works. You can change it later, once you understand more about MSHV. For now, the screenshot will make everything work. You can see in red that I already pressed "AUTO IS ON." My transceiver was already tuned to 14.074 MHz, a dedicated FT8 frequency. On the left side of the screenshot, you see "MONITOR" in green. If your Monitor button is not green yet, press it.

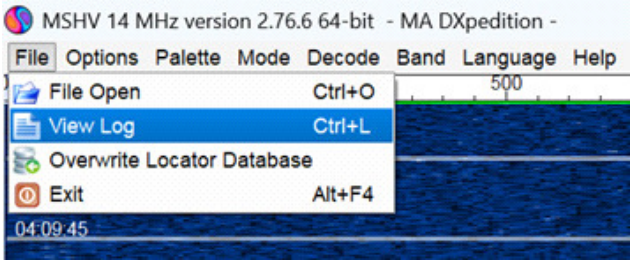
MSHV automatically selects the Rx and Tx frequencies, so you do not need to worry about that. In the advanced settings, you can also limit the audio bandwidth in which your FT8 software works, but that is something to explore after everything is working. Let the program run, and your screen will start showing QSO after QSO. I have never made more than 400 QSOs in 24 hours, and that was with good propagation.

We have to enter the callsign and the grid locator, located after the large "Gen Message" button. Adjust everything for your station.

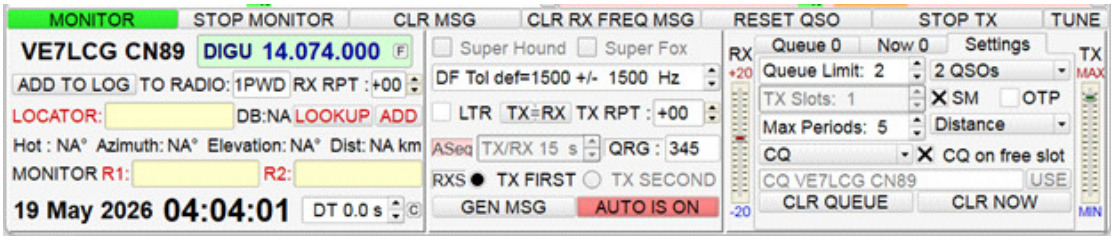

MSHV
Macros
Network Configuration
Radio And Frequencies Configuration
Distance unit: Kilometers Miles
Macros By Region: Region 1 Region 2 Region 3
Macros option for JTMS,FSK,ISCAT,JT6M
Report Grid RSQ And Serial Number
Macros option for MSK,FT,Q65
Activity Type: Standard
ARRL Field Day Exch: 1D NB
Roundup Exch: DX
Multi-Two Transmitter: (Requires Two Different Installed Copies Of Software) None
Macros:
My call =%M His call =%T RST or RSQ =%R 4 characters locator =%G4
6 characters locator =%G6 Random QRG =%QRG Serial number =%N
My suffix =%O His suffix =%H Separating numeral + my suffix =%SO
Separating numeral + his suffix =%SH
GEN MESSAGE
MY CALL: VE7LCG
GRID LOCATOR: CN89
Macros for JTMS,FSK,ISCAT,JT6M
Tx1 %T %M
Tx2 %T %M %R %R
Tx3 %T %M R%R R%R
Tx4 RRRR RRRR %M
Tx5 73 %M
Tx6 CQ %M
Tx7 CQ %QRG %M
SET DEFAULT MACROS
Macros for MSK,FT,Q65,JT65
Tx1 %T %M %G4
Tx2 %T %M %R
Tx3 %T %M R%R
Tx4 %T %M RR73
Tx5 %T %M 73
Tx6 CQ %M %G4
Tx7 CQ %QRG %M %G4
SET DEFAULT MACROS

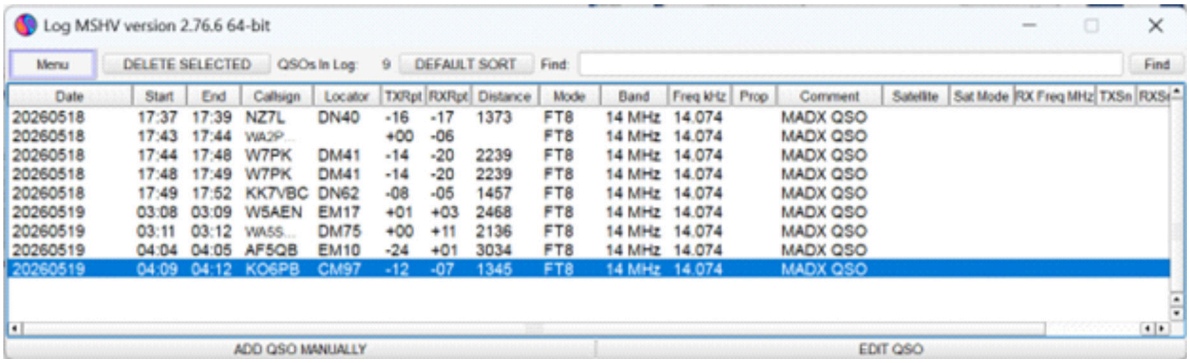


You can see the log by selecting:


MSHV 14 MHz version 2.76.6 64-bit - MA DXpedition -
File Options Palette Mode Decode Band Language Help
File Open Ctrl+O
View Log Ctrl+L
Overwrite Locator Database
Exit Alt+F4
04:09:45

Now let's go down to the main MSHV window as shown below, in the lower-right corner.




Log MSHV version 2.76.6 64-bit
Menu
DELETE SELECTED
QSOs In Log: 9
DEFAULT SORT
Find:
Find
Date Start End Callsign Locator TXRpt RXRpt Distance Mode Band Freq kHz Prop Comment Satellite Sat Mode RX Freq MHz TXSn RXSn
20260518 17:37 17:39 NZ7L DN40 -16 -17 1373 FT8 14 MHz 14.074 MADX QSO
20260518 17:43 17:44 WA2P... +00 -06 FT8 14 MHz 14.074 MADX QSO
20260518 17:44 17:48 W7PK DM41 -14 -20 2239 FT8 14 MHz 14.074 MADX QSO
20260518 17:48 17:49 W7PK DM41 -14 -20 2239 FT8 14 MHz 14.074 MADX QSO
20260518 17:49 17:52 KK7VBC DN62 -08 -05 1457 FT8 14 MHz 14.074 MADX QSO
20260519 03:08 03:09 W5AEN EM17 +01 +03 2468 FT8 14 MHz 14.074 MADX QSO
20260519 03:11 03:12 WA5S... DM75 +00 +11 2136 FT8 14 MHz 14.074 MADX QSO
20260519 04:04 04:05 AF5QB EM10 -24 +01 3034 FT8 14 MHz 14.074 MADX QSO
20260519 04:09 04:12 KO6PB CM97 -12 -07 1345 FT8 14 MHz 14.074 MADX QSO
ADD QSO MANUALLY
EDIT QSO

Troubleshooting and Final Notes

If your software does not work, start again from the beginning of this article and verify against every screenshot that you did not forget to check something. I myself went step by step through the MSHV program while writing this article. As a good practice, I recommend creating a Microsoft Word or PDF document every time you set up something in your transceiver, your computer, or the software connected to your transceiver. That is what I already did, and for this article I practically re-created from scratch a document that was initially meant only for me and had no text, only screenshots.

Note 1: MSHV works with higher ALC levels than other FT8 software. You can adjust the Tx slider to show whatever power you want on your transceiver, once you have indeed set up your transceiver for that power.

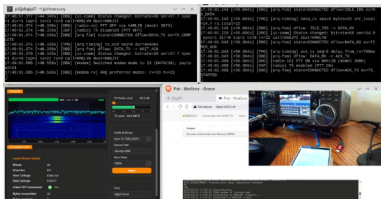
Note 2: The Rx level is automatically adjusted by the software to stay in the green zone. If somehow it is not, the software will give you a warning, and you will have to adjust the Rx level manually. It never happened to me.

Note 3: If you use multiple FT8 programs on your computer, keep in mind when switching from one to another that all of them are slow to release the ports. Wait for the previous FT8 program to fully terminate all its processes before starting a new FT8 program.

Note 4: MSHV also has strong capability for manual, non-automated FT8 work. That was not the purpose of this article, and MSHV comes with short, clear documentation. For manual FT8 work, I prefer enhanced JTDX. I got used to JTDX from my very beginning in FT8.

~ Daniel VE7LCG

Winlink Email Sent Over MERCURY on RF!



The guys at Rhizomatica just made a better VARA than VARA. Unlike VARA, it's free, open-source, runs on Linux and Raspberry Pi. While not directly compatible with the proprietary VARA encoding, it does use the same API so existing VARA-HF clients (Pat, Winlink Express) can immediately leverage this exiting new HF radio transport!

In the video, we use "Pat" (http://getpat.io) Winlink email client on "DigiPi" (http://digipi.org) and Mercury (https://github.com/Rhizomatica/mercury) to send an email message over RF from one Raspberry Pi to the other.

In the video the radio on the right (ic705) is the client running pat client (pat http), and the radio on the left (ic7300) is running pat server (pat --listen=vara http).

This is a first-ever technology demonstration and proof-of-life. Much more is to come, in fact, I think I'll create a MERCURY Winlink Server that everyone can run along side VARA, Packet, ARDOP, etc.

Both VARA and MERCURY leverage "Orthoganal Frequency Division Multiplexing" which is the foundation for modern/commercial RF transports, including WIFI. That's how we get our speed and reliability. MERCURY includes "gear shifting" dynamically adapting to conditions and fading SNR.

Project MERCURY https://github.com/Rhizomatica/mercury

~ KM6LYW

Automating the Yaesu FH-2

With an Arduino NANO

by ERWIN van der HAAR PA3EFR

As Radio Scouts we are involved and organize several HF radio activities. Depending on conditions and the length of the event it could very handy to use a voice keyer. Our inventory consists mainly of Yaesu equipment so the voice keyer choice is limited to a FH-2 remote device. Unfortunately, repetition of the recall of a memory slot depends on the sole finger action of the operators in charge, sometimes supported by a scout who sits aside the operator. It was during poor conditions, hence repetetive finger operations on the FH-2, that the idea was born to make a FH-2 Repeater which repeats memory slot recalls with predefined (but adjustable) interval times.

The **FH-2 Repeater** described in this article is a small, Arduino-based controller that plugs into the Yaesu FH-2 Morse keyer connector of your Yaesu transceiver and sends your pre-programmed messages automatically, at whatever interval you choose. It is not a commercial product. It is a homebrew project, designed from scratch using only through-hole components, and it invites you to build it yourself, improve upon it, and make it your own.

What Does It Do?

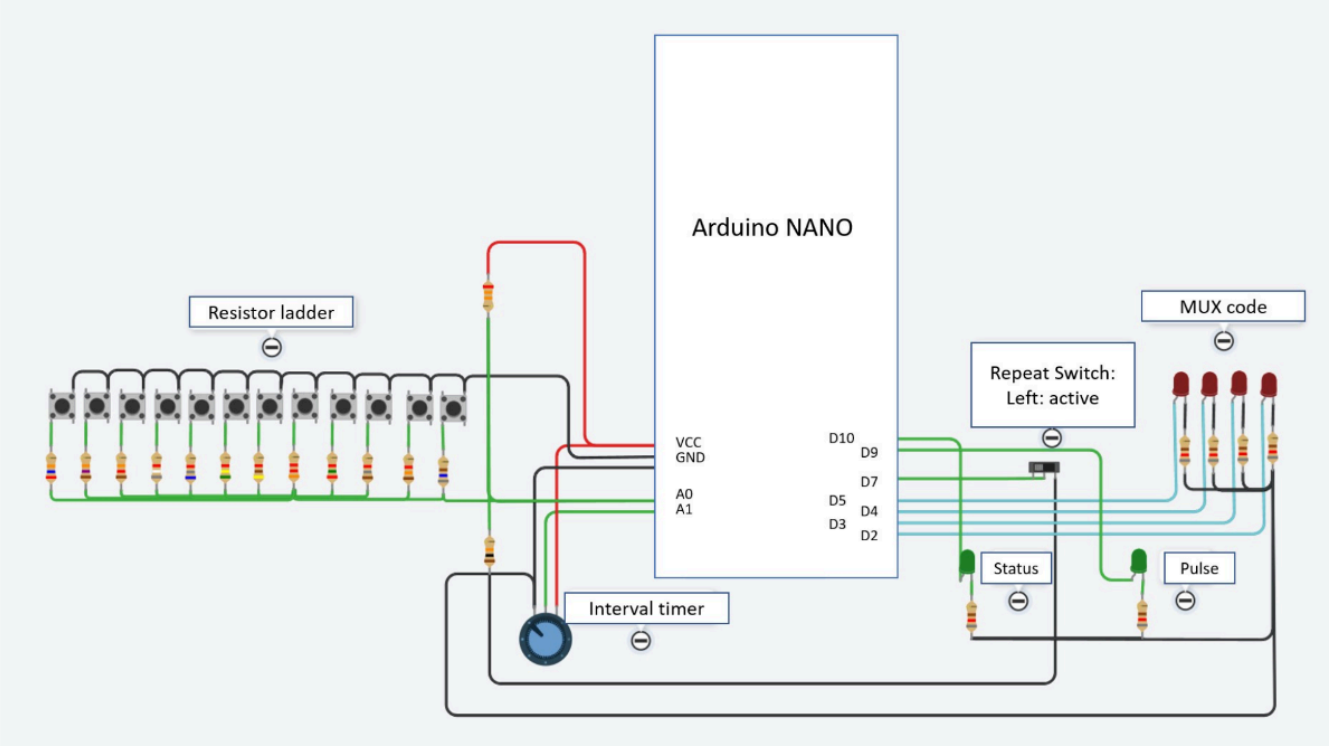
The FH-2 Repeater takes over the repetitive task of triggering the FH-2's memory keyer buttons at regular intervals. In practical terms, you press a button on the FH-2 (or on the controller), and from that moment onward the controller automatically resends that same message every 10 to 60 seconds — the exact interval is set by turning a front-panel potentiometer. You carry on with logging, antenna switching, or enjoy a well-deserved cup of coffee.

A front-panel toggle switch turns the repeat function on and off entirely. Two LEDs give you at-a-glance confirmation: one flashes each time a transmission is triggered, and the other glows steadily to tell you that an automatic cycle is running. If you need to stop immediately — a rare opening on another band, an urgent call on the radio — pressing any button other than the active one cancels the cycle instantly.

Erwin PA3EFR

Erwin is an active and versatile operator, currently retired from an active Air Force career where his last post was Spectrum Manager RNLAF.

Beyond personal operating, Erwin is a dedicated figure in the Dutch Radio Scouting community. He is the main driver and callsign holder behind PA3EFR/J, a group of Radio Scouts who set up a JOTA (Jamboree on the Air) station every year at a different location to promote amateur radio among Scouting groups — including stations in Germany and Switzerland.



Testing the design, ideas and software the [TinkerCad online simulator]is an ideal tool. Together with a helpfull AI machine the design was fine-tuned and developed before it was taken to the breadboard components.

All activity is also reported in real time over the serial port at 9600 baud, complete with timestamps, so you can connect a laptop, open the serial monitor, and have a detailed log of every event during your operating session.

```
[00012] Button 1 detected (voltage: 0.42V)
[00012] Interval cycle started, interval: 30s
[00042] Pulse sent: channel 1
[00072] Pulse sent: channel 1
[00083] Interval changed: 30s -> 45s
[00128] Pulse sent: channel 1
[00173] Cycle stopped by operator
```

How Does It Work?

Reading the FH-2 Button Matrix

The FH-2 exposes its button matrix through a resistor network, and each button produces a distinct voltage on the output line. The controller measures this voltage with the Arduino's built-in analogue-to-digital converter on pin A0. Each of the FH-2 buttons produces a characteristic voltage between about 0.38 V and 2.53 V, and the software compares each reading against a lookup table, accepting a match if it falls within a ±0.15 V tolerance window. A best-match algorithm handles the edge cases, making detection robust against minor power supply variations or temperature drift.

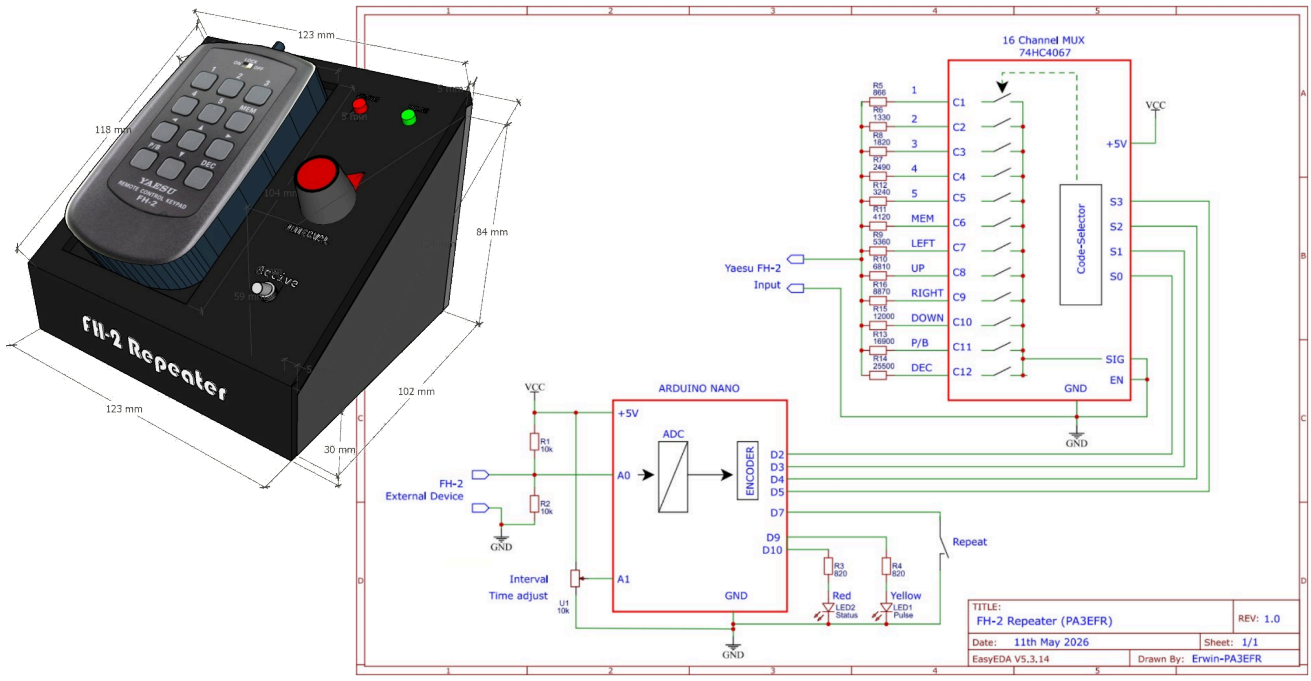
The Multiplexer — The Key to Pressing Buttons Electronically

To send a button press to the FH-2, the controller needs to briefly close the same electrical contact that a physical button would close. This is done through a 74HC4067 sixteen-channel analogue multiplexer — a cheap, widely available CMOS chip that costs only a few cents. Four address lines from the Arduino select which of the sixteen channels is connected, and an active-low enable line controls when the output is active.

When a transmission is due, the Arduino selects the correct channel, enables the multiplexer for 250 milli seconds, then disables it and resets to channel zero. A 2-second timeout in the software ensures the multi plexer always returns to a safe state, even if something unexpected interrupts the sequence.

The Interval State Machine

The heart of the software is a simple three-state machine: idle, active-cycling, and stopped. Pressing but tons 1 through 5 while the repeat



switch is on moves the system into the active-cycling state. From that point, the software checks the elapsed time against the potentiometer reading on every pass through the main loop — running at approximately 100 Hz — and triggers a new pulse when the interval expires. Turning the potentiometer takes effect immediately, without interrupting the current cycle, which is very useful for real-time adjustments during a contest.

Debounce and Reliability

Mechanical switches bounce — they make and break contact several times in the first millisecond after being pressed. The controller deals with this by requiring two identical consecutive readings separated by 50 milliseconds before accepting a button press as genuine. This simple debounce algorithm is robust in practice and adds no perceptible delay for the operator.

Circuit and Components

The circuit is deliberately simple. There are no surface-mount components, no exotic parts, and nothing that cannot be sourced from any of the usual suppliers. The complete bill of materials is short:

- Arduino NANO (ATmega328P) — the processing core
- 74HC4067 16-channel analogue multiplexer — the button emulator
- 10 kΩ linear potentiometer — interval adjustment
- SPDT toggle switch — repeat on/off
- Two LEDs with appropriate series resistors (pulse and status)
- 3.5 mm stereo jack socket — FH-2 connection
- Assorted resistors and decoupling capacitors
- Stripboard or a custom PCB

The Arduino is powered from USB during development and can be powered from an external 5 V regulator in a permanent installation. Total current consumption is modest — around 100 mA at most.

Function	Pin	Description
ADC Input	A0 (Pin 14)	FH-2 button voltage measurement
Interval Control	A1 (Pin 15)	Potentiometer wiper for interval adjustment
MUX S0–S3	D2–D5 (Pins 2–5)	4-bit multiplexer channel selection
MUX Enable	D6 (Pin 6)	Active-low enable for 74HC4067
Repeat Switch	D7 (Pin 7)	Pull-up input for repeat on/off toggle
Pulse LED	D9 (Pin 9)	Visual pulse confirmation indicator
Status LED	D10 (Pin 10)	Interval cycle active indicator

The Software

The firmware is written in standard Arduino C++ and follows a straightforward modular structure. There are separate functions for button

detection, multiplexer control, pulse generation, and serial reporting. The main loop uses a cooperative multitasking approach, cycling through all inputs and outputs at roughly 100 Hz. This keeps the code easy to read, easy to modify, and easy to extend.

Build It Yourself — You Can Do This

This project is accessible to any amateur who has soldered a few components and loaded a sketch onto an Arduino. If you have never done either of those things, this is an excellent first project: the circuit is forgiving, the components are inexpensive, and the Arduino ecosystem has outstanding documentation and a large, helpful community.

The through-hole construction is intentional. Every component can be held in place with two fingers while you solder it. Every joint can be inspected and reflowed if needed. There are no heat-sensitive plastic packages to worry about, no tiny pads to bridge accidentally, and no need for a microscope or hot-air rework station.

A Note for Those Who No Longer Solder

Not every amateur is in a position to build a project like this. Perhaps your eyesight makes fine soldering difficult, or your hands are no longer steady, or you simply do not have a workshop any more. That is entirely understood, and it is not a failure.

The intention of publishing this design openly is not to exclude, but to share. If the project interests you, perhaps a club member or a younger amateur in your circle would be willing to build it for you — a joint effort that passes on skills as well as producing a useful piece of equipment. The design is simple enough that it makes an excellent mentoring project.

For Jamboree On The Air this could well be a good solder project in the summer months for the scouts to take on and use during the JOTA in October. You will not regret the effort. Alternatively, the software and circuit description here may be enough to inspire someone you know to adapt the principle to a different controller or a different keyer altogether. Good ideas have a way of multiplying.

Conclusion

The FH-2 Repeater is a practical solution to a real problem, built from components that cost less than a contest entry fee and assembled in an evening. It is not the last word in automation, and it was never intended to be. It is a starting point: a working, documented design that you can build, understand, modify, and improve.

On behalf of the Radio Scouting Fellowship of PA3EFR/J, 73 and good luck with the build.

~ Erwin PA3EFT

Erwin is an active and versatile operator, currently retired from an active Air Force carreer where his last post was Spectrum Manager RNLAF.

Beyond personal operating, Erwin is a dedicated figure in the Dutch Radio Scouting community. He is the main driver and callsign holder behind PA3EFR/J, a group of Radio Scouts who set up a JOTA (Jamboree on the Air) station every year at a different location to promote amateur radio among Scou ting groups — including stations in Germany and Switzerland.

Together with Patrick PE2PVD, Erwin co-organises the Dutch Bunkers on the Air (PABOTA) pro gramme, which coordinates the activation of historical bunkers across the Netherlands for amateur radio contacts.

Erwin has also been involved in several commemorative special event stations. Notably, he and his brother PD9HIX led the PA82AD project, which followed the liberation route of the 82nd Airborne Division from Normandy to the Netherlands, opera ting from historically significant locations to honour the American forces.

His website (pa3efr.nl) serves as a hub for Radio Scouting news, BOTA activations, and online tools he has built for the commu nity — including Morse code and semaphore practice apps.

Modulated light

An Experiment in Communications

by VALENTIN GLIVENKO VE7ZFR

I became a licensed amateur radio operator last year at the age of 16. Now that I'm 17 and finishing school here in Canada, my friend Isaac, a prospective ham, and I decided to make a visible light communications system for our end-of-the-year project. The goal was to transmit audio across distances using nothing but photons.

This concept has been explained and showcased by various YouTubers, including ElectroBOOM. The system consists of two parts: a receiver and a transmitter. The receiver side is simple, consisting of a solar panel (some people used photocells), an amplifier, a battery, and a speaker. The transmitter uses an audio-emitting device, such as a phone or microphone, to send an audio signal into a basic LED circuit with a battery, resistor, and LED. The audio signal modulates the voltage from the battery, which changes the intensity of the light. These changes in light intensity are then received by the receiver and turned back into sound. I noticed that most of these projects were small scale, with the range limited to only a few centimeters. We thought it would be a good project to try modifying the design to increase the range of this communication system.

Like all engineers, we decided to first build a prototype of the "standard" circuit most YouTubers were building. After a few trips to the electronics store and a few days of assembling the circuit, we had it working. The range was very small; you had to hold the solar panel right above the LED to hear anything. We added an amplifier to the transmit side, and that gave a massive boost to the range. When we held the solar panel a little more than a meter away from the LED, the audio was faint but still hearable.

Isaac, left and Valentin demonstrate their project at the OTC.

We decided not to stop there. Our goal was to receive the audio at 100 m, about the length of a football field. Sending a signal that could be heard from such a distance required an entirely new transmitter setup. We bought a powerful 50 W LED, two heatsinks, an old warehouse lightbulb reflector, and components for the new circuitry. First, we installed the new lights onto the heatsink. Next, we had to design and build our own amplifier circuit, since we couldn't find any existing ones that met our needs. This process was not easy, as high school electronics courses didn't cover many things that were necessary to build a proper circuit. After doing some research, we went with a common-emitter amplifier. We researched and calculated the values for the resistors, capacitors, and transistor so that the circuit would work as intended. The reflector needed some work as well: the inside of it was a matte gray colour, and it did a poor job focusing and reflecting the light in the right direction. At first, there was only a slight increase in distance. Then we wrapped the inside of the reflector with reflective film, which instantly quadrupled the range compared with using no reflector.

For the final test, we went to a local school field. We set up the transmitter and receiver and turned on the music. We were impressed by how far we could hear the signal. Receiver overload was present up to 7 meters, perfect loud audio was heard between 8 and 11 meters, and after that the music grew quieter and quieter. What impressed us most was that we could still hear faint audio at a distance of 100 m, all the way on the other side of the field. All our hard work and dedication had paid off.

At the end of the day, we achieved our goal of transmitting audio over a distance of 100 m. What first looked like an extremely difficult challenge proved to be possible through hard work and a fair bit of research. I learned a lot of new things that I hope will help me in my future radio projects. Thank you all for reading,

~ Valentin VE7ZFR

What to do when the bands suck?

by JOHN CORBY VA3KOT

John Corby VA3KOT resides in Owen Sound, Ontario but is more often found operating CW out in the "Big Blue Sky Shack". He especially enjoys activating parks for the POTA program and blogging about his experiences at HamRadioOutsidetheBox.wordpress.com

Solar cycle #25 has reached its peak and is on the decline again. We may still have a few years of good propagation left but I am planning ahead. During the last solar minimum I adapted by … forgive me … increasing my transmit power. This time around I hope to keep working QRP, but increase my effective radiated power through bigger, more efficient antennas.

The peak of cycle 25 was actually quite a disappointment. The Sun became hyper-active spewing a few too many Coronal Mass Ejections, flares and high energy particles our way. Hopefully, now that the peak has passed, we might even get some less unpredictable propagation before we hit solar minimum.

The sign should also warn that bears don't react well to posing for "selfies"

As solar activity declines the higher bands seem to be open less often, so my personal focus is on 20m, 30m and 40m. Those bands are open throughout the solar cycle – except during solar storms of course. At least once per week I venture onto 80m for a CW rag chew with friends, but that is at the home QTH. When operating out in the woods 20m, 30m and 40m are my goto bands.

On the subject of "out in the woods" (my happy place), our local black bear population has awoken from its winter slumber and has been seen roaming in people places in my local town.

Bears are not usually a problem, they avoid human contact, but in the spring they are hungry and some of them associate people with food. Female bears with cubs can be very protective of their young which makes them potentially dangerous.

Antenna solutions for challenging conditions

One simple rule should be all that is necessary for getting a signal to propagate when the ionosphere is in combat with an angry Sun – or even when the Sun is dormant. Wire in the air = signal in the air. That is when it is probably a good idea to leave those very short, inductively loaded whips at home and start buying reels of wire and poles.

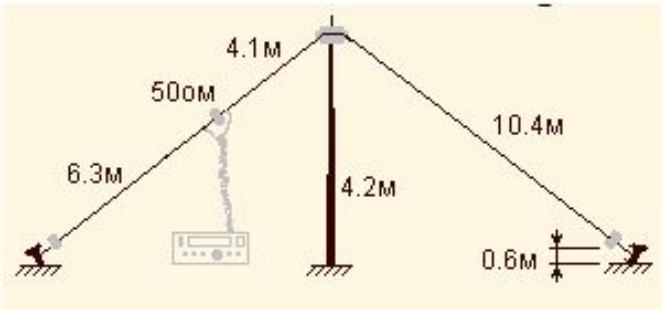
When I look back at what has worked in the past, the picture becomes very clear. Some of my small collection of QRP radios support only 20m, 30m and 40m. The 20m and 30m bands usually favor longer distance contacts, while 40m is better at shorter range. Out of these three bands I use 20m the most and, during the bottom of the solar cycle, 40m is my most used band. I don't get on 30m very often; it is a WARC band and some operators dislike "contest-like" activity such as POTA on the WARC bands. No sense creating friction.

Best option for 20m?

This may be a bit of generalization, but a half-wave antenna launches more signal in the air than a quarter-wave. All half-wave antennas are not created equal. For example the very popular End-Fed Half-Wave requires a very carefully engineered matching device. Improperly engineered, one-size-fits-all, high ratio transformers often have very low efficiency.

A 5/8 wave vertical antenna may be even better in some circumstances – for example when the base of the antenna and all the radials are raised above ground. But 5/8 of a wavelength is a bit of a tall order – on 20m that's 41 feet of antenna waving in the wind. Raise it above ground and you may have to attach a flashing red light at the top.

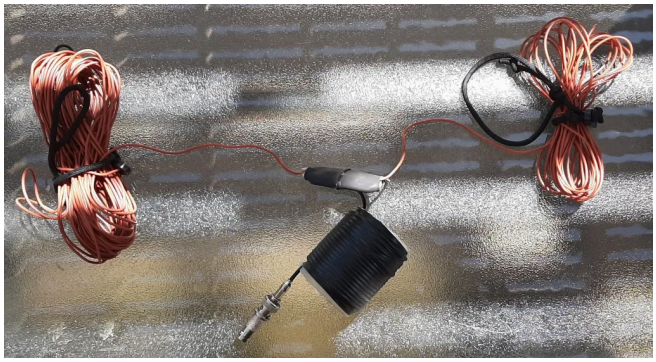
There is an even better solution. How about a 20m wire antenna that is low to the ground, is slightly directional and offers over 3dBi gain? Ham Radio Outside the Box explored this antenna three years ago; it is called the VP2E. Although VP2E sounds like a callsign (and it actually is a valid callsign) it is an abbreviation for Vertically Polarized 2-Element. It requires no tuner – and the VP2E is one full wavelength long.



VP2E antenna

I had great success with my VP2E before I stopped using it. It fell out of favor because of just one thing. Proponents of the VP2E claim that no baluns, ununs or feedline chokes are required. Perhaps, in theory, if the currents on either side of the feedpoint are balanced that could be true. In practise, even a small imbalance in the currents can lead to feedline radiation. To prevent this I added a current choke at the feedpoint.

Now this is where a problem arose. The feedpoint is not supported, so a choke hanging from the feedpoint pulls the wire down creating significant sag in the wire. The original choke that was used was made from 3 feet (~1m) of RG-316 coax looped three times through four snap-on ferrites; it weighed 126 grams.



VP2E ready to deploy, showing new lighter air-core current choke

The world's worst 80m Common Mode Current Choke!

When I decided to resurrect the VP2E I wondered whether I could improve the choke to decrease its weight. I chose to get rid of the heavy ferrites and build an air-core coil choke. I found about 9 feet of RG-174 coax in my junque drawer. I also found an old pill container made of plastic so light it almost defies gravity. After winding the entire length of the RG-174 around the super light plastic former I hooked it up to my NanoVNA to measure its effectiveness.

I ran a scan from 3 to 30 MHz and noted the attenuation across the HF bands. On the 10m band the choke is exceptionally effective with a common mode attenuation exceeding 30dB. On the other end of the scale, the common mode attenuation on the 80m band was a lousy 8dB. Well, the VP2E is a monoband antenna built for 20m, so the choke's performance on 80m is not a concern.

Performance on 20m is marginal, but acceptable, at -20dB. Since the current imbalance is likely to be small 20dB of common mode attenuation should be quite adequate. And, the new choke weighs in at 67 grams, nearly half the weight of the old choke.

It's stealthy too

Apart from its gain, another benefit of the VP2E is that it only needs a short pole for support. 4.2 meters (13.8ft) is the recommended height. My crappie pole is about 0.2 meters short but modeling the antenna shows very little impact - you work with what you got!

Where to buy a VP2E

This a real hobbyist's antenna; you can't buy it, you gotta build it! A 100ft reel of thin wire - I use silicone coated 22ga wire - is all you need. Cut it to the lengths shown in the diagram above. Solder the wires to a piece of coax feedline and you are ready to get on the air. Choke? I think it helps but you can use the antenna without one.

A versatile short, strong, light support pole

The center of my VP2E is supported on a 13ft crappie pole which is very light for carrying into the field. It is very strong too. Well actually, I threw away the very top sections of two crappie poles and a made a strong, light single pole out of the lower sections. It mounts on a fiberglass driveway marker pushed into the ground.

The exact same pole also works for my 40m wire antenna. It's a low dipole built for NVIS (Near Vertical Incidence Skywave). More details on that in a later post. Stay tuned.

~ John VA3KOT

'Echoes From The Rock' Marks 80 Years Of Ham Radio And Gibraltar Amateur Radio Society Anniversary

Amateur radio in Gibraltar officially flickered to life in the shadow of the Second World War. As wartime radio restrictions were lifted in the late 1940s, local and military enthusiasts who had developed a passion for electronics and wireless technology during the war began assembling their own stations. It was in 1946 that the first license with the ZB2 prefix was issued by the Gibraltar authority. https://www.yourgibraltartv.com/society/32842-echoes-from-the-rock-marks-80-years-of-ham-radio-and-gibraltar-amateur-radio-society-anniversary

VPD
Amateur Radio Group

Calling all retired or serving members and civilian employees of the Vancouver Police Department, who are active in amateur radio!

The VPD Amateur Radio Group is a new informal organization with no officers, dues, scheduled meetings or bylaws that seeks to provide a point of contact for serving and retired police officers who worked with the Vancouver Police Department. It's a place to share our interest in amateur radio and learn from each other's experience.

If there is enough interest to support the occasional breakfast or lunch meeting, or deploy a station to events like Field Day, POTA activations and the like, then we will do that, but for now we are just seeking potential members. You don't need to live in BC, or even in Canada.

The group has two callsigns (VE7VPD and VA7VPD) assigned by ISED and it would be fun to activate them in special events or contests, if there is enough interest.

Serving and retired VPD members who are amateurs are eligible to use either callsign as long as your date of usage has been assigned by the coordinator. Email Kevin McQuiggin VE7ZD at mcquiggi@sfu.ca to register a callsign assignment.

We know you're out there, and it would be great to add you to our roster as a serving or retired VPD ham! The group is informal and ham radio focused. We aren't one of those retiree groups with "politics" or an interest in Jurassic policing!

If you're interested, contact Kevin McQuiggin VE7ZD via mcquiggi@sfu.ca, or John Schouten VE7TI via communicator@ve7sar.net.

~ Kevin VE7ZD / KN7Q

The first QSL card to VE7VPD has arrived

Zero Retries

Interesting Emerging Trends Summer 2026

by STEVE STROH N8GNJ

Steve Stroh N8GNJ is the Editor of the Zero Retries newsletter (www.zeroretries.org) which promotes technological innovation that is occurring in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology.

When not writing Zero Retries, Steve experiments with Amateur Radio data radio systems in N8GNJ Labs (his shop) in Bellingham, WA,

Email: steve@zeroretries.net

Conference: https://www.zeroretries.org/p/conference

It's been a busy few months with myself and Zero Retries. The biggest event was (unplanned, at the beginning of the year) travel to and exhibiting Zero Retries (and Digital Library of Amateur Radio & Communications) at Hamvention 2026 in Xenia, Ohio, USA. To me, the first half of 2026 feels like "the calm before the storm" of a burst of more technological innovation in Amateur Radio that we'll see emerge by the end of 2026. In this column, I'll highlight some of the most exciting trends that I see beginning to emerge. All of what I discuss here were covered in my newsletter Zero Retries - links to the individual stories in the footnotes.

Voice Repeaters (and Net Operations) Migrating Into the 21st Century

At Hamvention 2026, there were two services supported by hardware products, for "dashboard visibility" of repeater operations and usage. Both services center are extended capabilities of **RepeaterBook** [1]. The first is **Project Argus** [2]:

Project Argus is a hardware monitoring solution that you can connect to your repeater or, alternatively a monitoring radio, that observes when the repeater is keyed up. The device sends the keyup date/time stamp and unkey date/time stamp to the RepeaterBook database and the repeater owner can either see the data privately or post the activity on the public RepeaterBook web site.

The second is **Project Apollo**[3]:

Project Apollo adds listening nodes for repeater activity and verification in the field to strengthen the quality of the information RepeaterBook already receives every day from users, admins, and repeater owners.

Public Apollo scanner-node views are live for Oregon and Idaho, with a UK node coming soon.

Why it matters: it adds another layer of confidence and helps keep repeater information more accurate and up to date.

Both Project Argus and Project Apollo allow visitors to RepeaterBook to see at a glance what the usage of a repeater, or region's repeaters, are in realtime. If you're a new Ham wanting to try out your new license or VHF / UHF radio, a quick glance at RepeaterBook will not only show you the closest repeater to you (on each band), but also which repeaters are active (and, if there is no activity for an extended period, perhaps the repeater is offline.)

The two projects are complimentary. Argus (primarily) provides information from hardware installed on a repeater to provide a fine-grained reporting of how active the repeater is. Apollo operates from an independent receiver(s) in an area to monitor multiple repeaters.

An unexpected result of RepeaterBook exhibiting at Hamvention 2026 was that there were many volunteers to host, at their expense, a Project Apollo receiver(s) in their area. RepeaterBook originally intended to slowly roll out Apollo receivers that were provided by RepeaterBook, but that may not be necessary.

What these two project will provide is a near realtime dashboard of actual voice repeater activity, removing some of the mystery and "tribal knowledge" about repeater operation, especially to new Hams with new equipment. I think that it's significant that Argus / Apollo could provide impartial, verifiable "ground truth" of actual repeater usage, rather than anecdotal reports from repeater owners, users, etc.

In addition to Argus and Apollo, at Hamvention 2026, RepeaterBook unveiled a number of new projects and capabilities to RepeaterBook [4], including a number of capabilities reserved for paid subscribers to RepeaterBook.

I wasn't familiar with this next item until I received an email from a Zero Retries reader. **Ham.Live** [5] was a web-based service that aided net control operations. The original developer decided to sunset the web-based service, but open sourced the code so that individual clubs, such as SARC could host it themselves for their use. But there is at least one project that hopes to resuscitate the hosted service - see my Zero Retries article - Ham. Live is Going Away; N5SAC, the Sachse Fire Station Ham Radio Club is Trying to Save It [6].

Another "net assistance" application that can either be used online, or self-hosted (including no dependence on an Internet connection) is the **KK7NQN Transcription Service Node (TSN)** [7], now called K**K7NQN AI Net Logger**. This system uses (local) Artificial Intelligence to transcribe speech so there's less manual recording of check-ins, etc. required. The primary Zero Retries story I did on KK7NQN TSN [8] is from nearly one year ago, and the TSN capabilities have continued to improve, so reference the KK7NQN link for the most up to date information.

Taken together, these capabilities, arguably, help move voice repeater operation solidly into the 21st Century with web-based visibility of actual repeater operation. Note that all of these capabilities are additive to repeater operation. None of them impact actual repeater operation - they just add greater ease of use / greater visibility of the actual operation of a repeater / repeaters in a region. Note that while these enhanced capabilities require some network access, it doesn't necessarily require *Internet access*. For example, a local Ham.Live or KK7NQN AI Net Logger could be operated via a high speed Radio Network such as AREDN (numerous links in the Vancouver, BC, Canada area) [9], Puget Sound Data Ring (HamWAN) [10], or BCWARN [11], all of which provide fast, TCP/IP based connectivity.

It would be ideal if all of the capabilities of these systems could be integrated into a single "repeater dashboard". For example, going onto RepeaterBook, clicking on a busy repeater, and seeing a transcription of typical discussions occurring on the repeater (KK7NQN AI Net Logger) or seeing the participation of a recent net on the repeater (Ham.Live).

HF Digital Capabilities Improve

There were a number of interesting new developments relating to technological innovation in HF around the same time as Hamvention 2026. From my "big picture" view of Amateur Radio for Zero Retries, these developments conflate in my mind to provide exciting new capabilities for HF operation.

Although there was no major new news around Hamvention 2026, The **Packet Radio Forwarding Network (TPRFN)** [12] continues to improve and expand. TPRFN is a network of HF stations dedicated to transferring messages **regionally**, reliably, using standardized systems, data modes (not just Packet Radio technology), and Near Vertical Instance Skywave (NVIS) [13] antennas and techniques. The combination of using modern HF data communications modes and NVIS results in more reliable (predictable) message forwarding than previous . Some stations in TPRFN are already testing Mercury as a data communications mode.

iShareRadio [14] is a new service / web application that allows clubs and individuals to share remote access to a radio or radios. It is not (intended to be) specific to HF radios, or particular radio manufacturers, but in its initial capabilities are limited to FlexRadio units as FlexRadio's remote access capabilities are the best-developed and fine grained. Eventually other radio manufacturer's units will be incorporated into iShareRadio (if the radio can be operated remotely). iShareRadio has a lot of features needed for sharing of club-owned radios such as "dues paid?", "what does each user's license allow for HF operation (including receive-only for those that aren't yet licensed", etc. The existence of iShareRadio makes remote operation of radio(s) much, much more feasible than other remote operation applications / services. Being able to remotely operate an HF radio instead of the expense and complexity of buying and installing one at your individual location can act as an incentive to upgrade from Canada's Basic license to Basic with Honours, or in the US, from Technician to General.

The **FlexRadio Aurora series** radios [15] were announced at Hamvention 2025, but took some months to be available. To acknowledge the "elephant in the room", yes these radios are expensive. I'm a fan of FlexRadio products because they are *Software Defined Radios*. Unlike the other major Amateur Radio manufacturers, the capabilities of FlexRadio products are entirely created in software, with only the essential hardware such as the power amplifier stage, being hardware.

Aurora has two unique capabilities to recommend them as exciting, new HF radios.

The first new capability of Aurora is that it's a **500 watt HF *radio***. For high power HF operation, Aurora is extraordinarily power-efficient from the implementation of Polar Modulation technology [16].

An Aurora radio can output 500 watts while being powered from a standard 15 amp 125 volt circuit. Another amazing thing about the power efficiency of Aurora is that it is rated for 100 % duty

To me, this makes the ability to use high power on HF much more approachable - no complex interconnection to an external amplifier, requirement for a dedicated 240 volt circuit, etc. You don't have to use 500 watts… but it's there to be used if you want it / need it, built-in.

A subset of the power output capability described above is that Aurora also operates on the 6 meter (Low) VHF band (50 - 54 MHz)… but the power output on 6 meters is "only" 200 watts. In my opinion, being able to transmit at 200 watts on 6 meters could be a useful capability for *regional* communications. 6 meters is easy to receive - antennas are manageable, well within the capabilities of inexpensive receivers such as software defined radio "dongles" [17], and thus, using an Aurora for transmitting regional bulletins, etc. might be an interesting new capability.

The second interesting and unique capability of Aurora [18] is that **user-defined software / mode enhancements** can be added into the radio. (FlexRadio calls this the "Docker container feature", introduced in FlexRadio's SmartSDR version 4.2.18.)

This capability became notable with the release of FreeDV 2.3.0 [19]. FreeDV RADE [20] is a digital voice mode designed specifically for the vagaries of HF, such as fading. FreeDV is an Open Source project. Notably, it has a narrower (1.5 kHz) bandwidth than SSB, but the voice bandwidth that is transmitted is (equivalent to) 8 kHz. FreeDV RADE's voice quality is remarkably good because it benefits from the digital capabilities including Orthogonal Frequency Division Multiplexing (OFDM) which implements multiple "subcarriers" and Forward Error Correction (FEC).

When FreeDV is added to a FlexRadio (Aurora or 8000 series), it's "just another mode selection". Unlike previous versions of FreeDV, or using FreeDV on other radios, no external computer, and especially no second speaker / microphone is required. Make the selection of FreeDV, tune, and talk.

This capability to add user-selected software into a FlexRadio Aurora or 8000 series isn't unique to FreeDV, such as…

Mercury [21] is a new data communications mode also designed specifically for the vagaries of HF. It has been in development for several years, but it was "officially released" in May. Like FreeDV, Mercury is an Open Source Project. Mercury is intended to fill the same role as VARA HF [22] (but it is not currently as capable as VARA HF). Mercury implements the same software interfaces (TCP/IP sockets) as VARA HF, so it can work with a wide variety of applications such as VarAC [23] (currently not directly supported by VarAC, but it has been shown to work). Demonstrating one of the advantages of Open Source, the Mercury developers decided to use FreeDV's proven (to be robust) OFDM subsystem instead of creating their own.

While Mercury has not (yet) been adapted to be installed in a FlexRadio Aurora or 8000 series, conceptually, that could be done. If that is implemented, Mercury could be as simple as running an application on your computer to send email, bulletins, etc. with no need to run a complex companion application such as is the case now with VarAC requiring VARA HF as the "modem".

Collectively, the FlexRadio Aurora, FreeDV RADE, and Mercury have made HF operation of digital voice and data easier to use than ever before, and more reliable.

To me, the Aurora is the most exciting and interesting HF radio that I've ever seen, and when I decide to make a major investment in HF capability, the Aurora is my current HF radio of choice, in no small part because Aurora can be made better and more capable over time with the addition of user-selected software enhancements / modes.

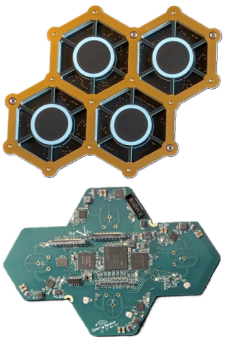
Software Defined Radio Advancements

I've previously discussed the **Linux Handheld Transceiver (LinHT)** [24], a project to build a 70 cm (420-450 MHz) Software Defined Radio in a portable radio form factor that runs Linux and can also run GNU Radio 3.x "Flowgraphs" (GNU Radio's version of applications). Development of LinHT is proceeding, and the hardware has advanced to Revision B, with the major improvement from Revision A is the incorporation of a power amplifier stage to boost the output power to nearly 5 watts. A further update to Revision C hardware will be necessary, but if development proceeds as anticipated, Rev C might be able to be manufactured in volume, allowing individuals with reasonable electronic assembly skills to create their own LinHT by installing a LinHT circuit board and transplanting some components, case, etc. from a Retevis C62 [25] "donor" unit to make it into a LinHT.

The LinHT is an Open Source project, so it is feasible that a commercial manufacturer might (and hopefully will) create a commercial LinHT. There's also the possibility of a motivated and capable non-commercial organization to do the same, or perhaps just convert stock C62s into LinHTs en masse. Building such a system that was (then) not considered commercially viable was the genesis of TAPR [26] - to manufacture the original TAPR TNC (later renamed the TAPR TNC-1). With crowdfunding and plug-and-play e-commerce capabilities, creating such a group, or micro business, is entirely feasible to bring the LinHT to market at least at small scale.

Nearly one year ago, Bruce Perens K6BP said [27] *LinHT is the most important hardware project in Amateur Radio today*. I agree with that statement as the LinHT could easily become a nexus device for attracting radio experimenters into Amateur Radio to be able to use their Software Defined Radio / GNU Radio skills and experimental software on the 70 cm band with reasonable output power, instead of being constrained to power levels and hardware restrictions inherent in using devices, systems, and restrictions such as LoRa and Wi-Fi, the unlicensed bands, and only using low power. For those of us not on the bleeding edge of experimentation, the ability to run modes.

Another exciting Software Defined Radio Project is the launch of the crowdfunding phase of **QuadRF** [28]. QuadRF is an assembly of 4 "disc" antennas (approximately 2-3x the size of a Loonie) that operate on the 5 GHz band, with a phased array antenna capability [29]. Phased array technology allows an RF transmission to be *electronically steered* by exciting the individual elements of the antenna with different phase transmissions. This is



the first such technology reasonably accessible to radio experimenters. The ultimate goal of ScaleRF is to be able to assemble many QuadRF units into a large array capable of Earth Moon Earth (EME) communications at 5 GHz. I think there is another potential goal for QuadRF, but not yet stated by anyone, of using a cluster of QuadRF units to communicate with Low Earth Orbit (LEO) Amateur Radio satellites.

In Closing

I think it's indicative of the rising interest in building networks within Amateur Radio… and hopefully within the ARRL itself, that the ARRL recently published a new book - **Digital Networking for Ham Radio** by Glen Popiel KW5GP [30]. A slightly more accurate title would be Microwave Networking for Ham Radio as the book focuses almost entirely on networks that operate in the microwave region, such as AREDN, with some attention paid to Meshtastic operating in the 902 - 928 MHz (33 cm) band.

There are a number of other "Zero Retries Interesting" projects in progress that will hopefully "ship" later in 2026.

One is the promising **IP400 (Mesh) Network Project** [31]. Although there has been nothing publicly stated about this project in the last several months, I'm told that progress is being made, and potentially there will be an announcement later this Summer.

An outgrowth of IP400 is a **new data communications mode for VHF / UHF** [32] that uses OFDM techniques to transmit higher speed data than has been previously possible with audio interfaces. Yes, that's a mouthful but think of the same technologies as VARA FM that with careful choice of audio interface and radio with a "flat audio" interface can achieve 25 kbps in a 12.5 kHz VHF / UHF channel. The development of this new data mode ("IP400 / NinoTNC mode?") is a collaboration between the IP400 developers and the developers of the NinoTNC [33]. It's possible that a new version of the NinoTNC (or, perhaps, a new software version for existing NinoTNCs) could be faster and more robust than VARA FM, and as an Open Source project could become embedded into many devices, operating systems other than Windows, with no license fee required.

Another project I'm watching in Zero Retries in 2026 is **Mesh Operations Protocol (MOP)** [34]. This is a new, well thought out mesh network system designed for Amateur Radio VHF / UHF. One of the innovative aspects of MOP is that the transmissions are deliberately short to minimize consumed airtime. A MOP transmission will be 4800 bps and use OFDM techniques, but *MOP gateway beacons are transmitted as standard AX.25 UI frames at 1200 baud AFSK. Any APRS station, Direwolf instance, or aprs.fi can see them*. Thus even if a station isn't equipped for MOP, they can still be aware that a particular frequency is in use by MOP. MOP is still in development and is an open source project.

I have a lot of hope for the use of **AREDN networks on the 902 - 928 MHz (33 cm) band** now that radio chipsets are much more available for the years-old 802.11ah / Wi-Fi HaLow [35] and there is now support in released / production versions of AREDN software [36] for radios such as the ALFA Tube-AHM [37]. The ability to use the 33 cm band makes building small scale local AREDN networks much more feasible. For example, such a network could reasonably be implemented in housing developments, condos, or apartments where external visible antennas are generally banned. The low profile of such radios, and perhaps even use of omnidirectional antennas [38] may not require a high profile centralized node.

Lastly, my wife Tina KD7WSF and I have *launched once more, into the breach* in announcing that **Zero Retries Digital Conference (ZRDC) 2026** [39] will be held on Friday, October 16, 2026 at the Roundhouse Conference Center in San Ramon, California (San Francisco Bay Area), USA. The ZRDC 2026 venue is very close (an easy walk) to the conference hotel for Pacificon 2026. The two events are not related. Tina and I were so impressed that there were many more attendees at Pacificon that were "Zero Retries" kinds of folks, and it made sense to try to put ZRDC 2026 in proximity to Pacificon. For example, ScaleRF unveiled the prototype of the QuadRF at Pacificon 2025.

Have a great summer, SARC folks! Tina and I hope to attend another SARC event, or two, this Summer.

~ Steve N8GNJ

References:

[1] https://www.repeaterbook.com/

[2] Zero Retries 0249 - Announcing Project Argus - https://www.zeroretries.org/i/195194697/announcing-project-argus

[3] Zero Retries 0251 - RepeaterBook Project Apollo - https://www.zeroretries.org/i/196951818/repeaterbook-project-apollo

[4] https://www.repeaterbook.com/hamvention/

[5] https://github.com/Constant-Digital-Holdings-LLC/hamlive-oss

[6] Zero Retries 0255 - Ham.Live is Going Away; N5SAC, the Sachse Fire Station Ham Radio Club is Trying to Save It - https://www.zeroretries.org/i/201800372/hamlive-is-going-away-n5sac-the-sachse-fire-station-ham-radio-club-is-trying-to-save-it

[7] https://kk7nqn.net/

[8] Zero Retries 0217 - KK7NQN Transcriber Service Node – Now Open to Any AllStar User - https://www.zeroretries.org/i/171621573/kk7nqn-transcriber-service-node-now-open-to-any-allstar-user.

[9] https://worldmap.arednmesh.org/#6.36/49.375/-123.671

[10] https://hamwan.org/

[11] https://www.bcwarn.net/

[12] https://www.tprfn.net/what-is-tprfn

[13] https://en.wikipedia.org/wiki/Near_vertical_incidence_skywave

[14] https://explore.ishareradio.com/

[15] https://www.flexradio.com/products/categories/aurora/

[16] Zero Retries 0221 - Polar Modulation - It's a Big Deal - https://www.zeroretries.org/i/173489163/polar-modulation-its-a-big-deal

[17] RTL-SDR.com makes some of the best, in my opinion - https://www.rtl-sdr.com/buy-rtl-sdr-dvb-t-dongles/

[18] This capability is also present in the FlexRadio 8000 series radios - https://www.flexradio.com/products/categories/radios/

[19] https://freedv.org/freedv-2-3-0-flexradio-integration/

[20] https://freedv.org/radio-autoencoder/

[21] Zero Retries 0250 - Rhizomatica Releases Mercury, a Fully Open-source Modem for Digital on HF - https://www.zeroretries.org/i/196265613/rhizomatica-releases-mercury-a-fully-open-source-modem-for-digital-on-hf

[22] https://varamodem.com/#VaraHF

[23] https://www.varac-hamradio.com/

[24] Zero Retries 0255 - LinHT Rev B Status: What Works, What Broke, and Why Rev C is Next - https://www.zeroretries.org/i/201800372/linht-rev-b-status-what-works-what-broke-and-why-rev-c-is-next

[25] https://www.retevis.com/products/retevis-c62-uv-high-power-noise-reduction-durable-business-radio-with-noaa-group-call-6pack

[26] https://tapr.org/history/

[27] https://web.archive.org/web/20251104201636/https://perens.com/2025/08/12/whats-wrong-with-ardc/

[28] This project has cycled through a number of names, but seems to have settled on ScaleRF (earlier, MoonRF) as the organization / company, with the project itself called QuadRF. https://moonrf.com/

[29] https://en.wikipedia.org/wiki/Phased_array

[30] Zero Retries 0240 - Impressions of ARRL's New Digital Networking for Ham Radio Book - https://www.zeroretries.org/i/193913967/impressions-of-arrls-new-digital-networking-for-ham-radio-book

[31] https://ip400.adrcs.org/

[32] https://adrcs.org/adrcs/news/

[33] https://tarpn.net/t/nino-tnc/nino-tnc.html

[34] https://smasher.be/mop/

[35] https://en.wikipedia.org/wiki/IEEE_802.11ah

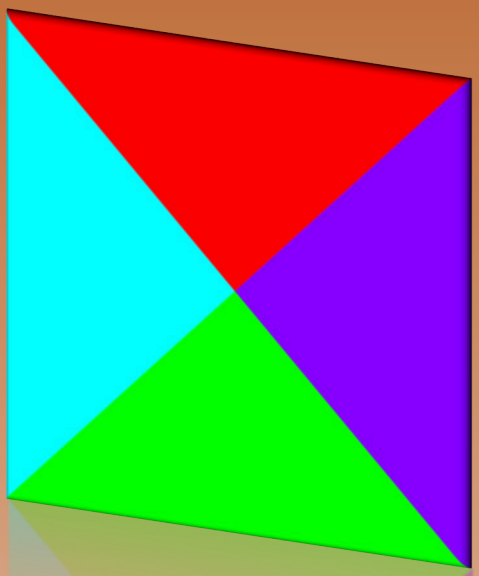
[36] https://www.arednmesh.org/content/aredn-production-release-42610

[37] https://www.alfa.com.tw/products/tube-ahm?variant=39857542725704

[38] Some long time AREDN users are skeptical… but I'm hopeful enough to purchase some units and conduct my own experiments.

[39] https://www.zeroretries.org/i/160208521/zero-retries-digital-conference-2026

Foundations of Amateur Radio



What does amateur radio bring to your life?

by ONNO BENSCHOP VK6FLAB

Onno Benschop
VK6FLAB

To listen to the podcast, visit the website: http://podcasts.vk6flab.com/. You can also use your podcast tool of choice and search for my callsign, VK6FLAB.

Full instructions on how to listen are here: https://podcasts.vk6flab.com/about/help

The other day I went for a walk around the block for the first time in a while. It's something I did for a time and then for several reasons, mostly to do with health, didn't. For me it's the mental equivalent of having a shower with the added benefit of not having to dry my hair, in other words, it's a place I go to with the intent of generating shower thoughts.

During my walk, away from the forces pulling me in all manner of directions, none of which have anything to do with amateur radio, away from my keyboard, away from my screen, away from technology challenges, although I'll admit that my phone was in my pocket, I took about twenty minutes to walk and daydream, to follow my thoughts and to see where they'd end up.

I got to this point because sitting at my desk I was getting nowhere trying to put together my thoughts in any sequence at least resembling coherence. While it's happened before, it's not something that occurs often. The day before I'd started writing, almost as-if possessed, about what amateur radio means to me, but during my walk I started wondering about the people who leave this hobby and the community embracing it.

I've often said that F-troop is a weekly net for new and returning amateurs, both people who have a license that's still hot off the printer, and others who have one typed up on an IBM Selectric, signed

with a quill, ink faded with age, paper yellowed by sunlight, potentially with coffee mug rings on it, stashed somewhere in a drawer.

I wondered about those returning amateurs and asked myself about the nature of leaving a hobby. It occurred to me that people leave for many different reasons, and it would be foolhardy to consider that all of those reasons are controllable by our community. While bullying and arguments exist, each responsible for their share of people leaving, it seems to me that some amateurs leave because there's too much other stuff going on in their lives, things that actively or passively prevent amateurs from participating.

This is difficult for me to relate to because for me, amateur radio is an intrinsic part of my life, in that it often quietly shapes how I view the world and learn from it. I see it when I notice a television antenna pointing in the wrong direction, when I install a new Wi-Fi router somewhere, when a signal is lost to a manned mission around the Moon, when I open the garage door and when I read that researchers at the National Institute for Standards and Technology, better known as NIST, have developed a new method for creating chips that process photons similarly to how traditional chips process electrons which can generate a rainbow of colours, though they didn't use the letter "u" to describe them.

While those examples might be somewhat obvious, amateur radio is also there when I see someone share a tiny electronic paper screen on social media and I consider how I might use that when I go portable. It's there when I'm walking in a park and when I'm looking at a beach, it's there when I see metal artworks or painters poles at the local hardware store and when I watch a movie with radios anywhere on screen. It's there when the topic of physics arises and when some electromagnetic phenomenon occurs. Like radio waves and air, it's pretty much part of my daily existence.

I will add that this same depth of connection exists between me and computers. Watching "Flight of the Conchords" I cannot help but notice that Murray's computer keeps changing and that I miss the Commodore Vic 20 sitting behind him surrounded by ever changing New Zealand tourism posters.

In other words, I cannot imagine ever not having radio or computers in my life. I'm mentioning all this because my experience isn't universal. While I'm sure that I'm not alone in this deep affinity, the community as a whole invariably ranges between people who could take or leave the hobby at a moment's notice and those who couldn't live without it and beyond our community there are people who are, depending on your perspective, blissfully or woefully, unaware of our existence.

All this to say, your experience of this hobby is not the same as that for everyone else, neither is your experience of life. This is revealed more clearly in what we think the hobby means, whether or not FT8 is a blessing or a curse, contesting is ridiculous or amazing, why 40m is better than 20m or vice-versa and if the hobby died when the ITU stopped requiring Morse code, or saw a rebirth.

It should be obvious by now, but I think it's important to be explicit. Amateur radio is your hobby. It's what it means for you. Not for your mate, not for me, not for the people in your club, the local email list or social media. Just you.

So, use this as an opportunity to think about this, in my not so humble opinion, absolutely amazing hobby and what place it has in your life.

~ I'm Onno VK6FLAB

All podcast transcripts are collated and edited in an annual volume which you can find by searching for my callsign on your local Amazon store, or visit my author page: http://amazon.com/author/owh. Volume 7 is out now.

Feel free to get in touch directly via email: cq@vk6flab.com, follow on twitter: @vk6flab or check the website for more: http://vk6flab.com/

If you'd like to join a weekly net for new and returning amateurs, check out the details at http://ftroop.vk6flab.com/, the net runs every week on Saturday, from 00:00 to 01:00 UTC on Echolink, IRLP, AllStar Link, IRN and 2m/70cm FM via various repeaters.

If you'd like to participate in discussion about the podcast or about amateur radio, you can visit the Facebook group: https://www.facebook.com/groups/foundations.itmaze

This podcast episode was produced by Onno (VK6FLAB). You can find more at http://vk6flab.com/

A follow-up to our 2024 Summer School

Our RF Communications High School Semester Course

by JOHN SCHOUTEN VE7TI

At first glance, a high school classroom may seem an unlikely place to discover the magic of radio. Yet that is exactly what happened when our July 2024 Summer School RF Communications course introduced a group of students to the world of Amateur Radio—and the results were extraordinary *[The Communicator September-October 2024]*. By the end of that program, 19 students had earned their Canadian Basic Amateur Radio Certificate, several with Honours (and HF privileges), while three went on to achieve Advanced certification.

That remarkable beginning inspired high school electronics teacher Adam Drake, VE7ZAL, himself a graduate of my Surrey Amateur Radio Communications Basic course, to think bigger. He applied to the Surrey School Board for permission to turn the idea into a full-semester credit course: 17 weeks long, with five 80-minute classes each week, first thing every morning. Approval came through, and once again I was invited to help teach the RF and amateur radio portions. I accepted—though not without some hesitation, as dawn has never been my favourite hour. Still, the Summer School experience had been so rewarding that I was eager to see what might happen when the subject was given room to breathe over an entire term. What followed was not simply a repeat of the summer's success, but a far more complex, complete, and ultimately more revealing, experience.

For someone who left school 55 years ago—and who is more than four times the age of these Grade 11 and 12 students—it offered an eye-opening glimpse into the realities of today's classroom. Kwantlen Park High School, an inner-city school serving many immigrant families, is shaped in part by the challenges that come with language barriers and varied educational backgrounds. From the outset, students were told there was no obligation to write the Amateur Radio exam. A passing mark—and three course credits—could be earned by completing two assignments built around electronics principles and kit construction. Out of 30 students, about a third had deliberately chosen the course and were genuinely curious about the subject and the careers it might lead to. Another third were willing to give it a try because it sounded interesting. The rest had ended up there simply because their first-choice elective was unavailable.

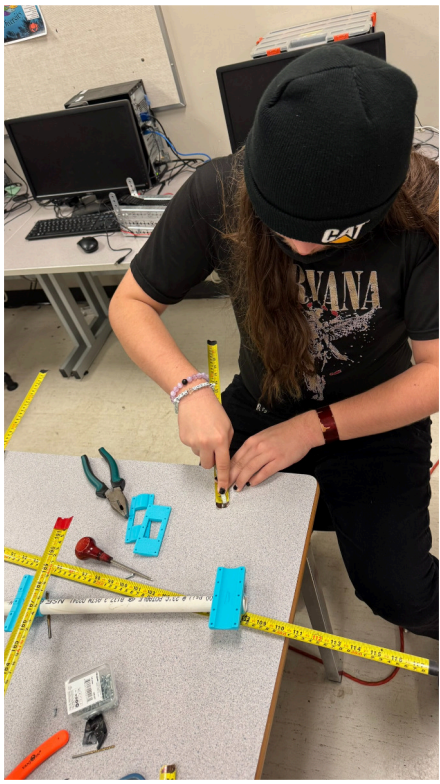
That uneven starting point soon made itself felt. Two students never appeared at all. A few others drifted into class late, half-awake

or distracted by video games. Punctuality and attendance were not what they might once have been, and Adam, with the calm realism of an experienced teacher, helped me understand that this too was part of the modern classroom. But if that had been the whole story, it would hardly be worth telling. The real story was what happened when curiosity took hold.

We brought in a number of guest presenters, and their visits changed the atmosphere in the room. These were people who knew both Amateur Radio and the professional RF world firsthand, and they shared their new knowledge with generosity and enthusiasm. For the students, it was a chance to step beyond theory and textbooks and see where these skills could lead in the real world. For me, it was a pleasure to watch the subject come alive for the students. I remain deeply grateful to them for helping make that happen.

Above: Some of our 11 successful students who gained their amateur radio priveleges displaying their donated transceivers.

The students who had chosen the course responded exactly as one might hope. They overcame mic fright, learned to use transceivers, practised operating procedures, and threw themselves into the hands-on side of radio. Some built an antenna. Two even tried their hand at CW. When exam time arrived, several needed more than one attempt to reach the required 70%, but they persisted. By the end of June, eleven students had earned a VE or VA7 callsign, several with Honours. In a classroom where success was never guaranteed, that felt not only hard-won, but genuinely inspiring. Kudos to those that applied themselves.



To me, that makes this a true success story—especially for what may well be the only course of its kind in not only the Canadian public school system, but in North America. More importantly, it is a reminder that when young people are offered something practical, challenging, and connected to the wider world, many will surprise you. Sometimes all it takes is the right spark. As one student put it, after passing with honour certification: “This is the best thing that ever happened to me”. And for me that makes getting up at dawn all the more worthwhile.

~ John VE7TI

More photos on page 112

Back to Basics

From The Canadian Basic Question Bank

Inside the 2025 Basic Qualification Question Bank Update

John Schouten VE7TI has been teaching amateur radio courses for over 25 years, and is the Course Coordinator for Surrey Amateur Radio Communications

Having now completed several courses teaching to the Canadian Basic Amateur Radio Question Bank revised in July 2025, I believe that I can now report on what Canadian amateur radio candidates, instructors, and examiners need to know about the new Basic examination material.

In early 2025, Innovation, Science and Economic Development Canada (ISED) released the first major update to the Basic Qualification Question Bank since 2013. The revised bank, which took effect on July 15, 2025, contains 984 questions, including 201 entirely new items developed by a committee of 20 RAC instructors and Accredited Examiners. A companion document published by Radio Amateurs of Canada lists all 201 new questions and their correct answers, allowing candidates, instructors, and guide authors to focus on the new material. The additions touch every domain of the syllabus, from regulatory conditions and operating procedures to detailed component-level and systems-level technical knowledge.

What follows is a technical tour of the key themes introduced in the 2025 update. The changes begin with the rules every operator must know, then move through operating practice, station design, receiver and transmitter architecture, antennas, digital modes, and propagation.

Regulatory and Licence Conditions

Several new questions codify the costs and permissions that govern amateur operations in Canada. Candidates must now know that a replacement call sign necessitated by a move to a new province or territory is free, whereas changing an existing call sign (including adopting a two letter suffix) carries a $60 fee.

The absolute prohibition on transmitting false information is restated, along with the penalty for malicious interference: a fine of up to $5 000, a prison term of up to one year, or both. Questions on third-party servicing clarify that repairing, reprogramming, or placing an amateur transmitter into service on behalf of another person is lawful only if both parties hold an Amateur Radio Operator Certificate. The update also draws a clear line regarding equipment use: amateur gear may never be used to transmit outside amateur bands, modified or not, because it lacks certification for such operation.

Operating Privileges and International Rules

Minimum qualification levels are specified for several specialized activities. Assembling commercially available transmitter kits of professional design and operating cross-band repeaters require only the Basic qualification, but remote operation of a transmitter—including changing frequency, mode, or power—requires both Basic and Advanced qualifications. Test transmissions are subject to the same station identification rules as routine contacts.

The international section explains that foreign amateurs, other than U.S. citizens, may operate in Canada only when a bilateral agreement exists and the visitor has obtained the appropriate permit; CEPT licence holders are granted Advanced privileges. U.S. amateurs must announce their location by city and province at least once per contact, while Canadians operating in the U.S. append “portable” or “mobile” and the visited area’s prefix to their home call.

Power Limits and RF Exposure

New questions define the maximum transmitter output power: 2250 W PEP for Advanced qualified stations on most bands, measured at the output of the transmitter or external amplifier. On 60 m the effective radiated power (ERP) limit is 100 W PEP, and on 630 m and 2200 m the equivalent isotropically radiated power (EIRP) limit requires accounting for antenna gain. The update also references Safety Code 6, noting that below 10 MHz the second established adverse health effect after energy absorption is nerve stimulation. EMCAB 2 definitions classify home entertainment devices as “associated equipment” and garage door openers as “radio sensitive equipment,” guiding interference resolution.

Station and Operating Practices

On-air protocol is refreshed. When calling a specific station on voice, the preferred format is “desired station’s call, followed by ‘this is’ and your call.”

Antenna tuner adjustments before joining an SSB net should be made 3–5 kHz away from the net frequency.

The Morse code signal “R” means “All received,” and the S meter standard of 6 dB per S unit is used to deduce that a drop from S9 to S8 corresponds to a power reduction from 100 W to 25 W.

Contest and emergency protocols also appear. A grid square request seeks a four- or six-character location code; a message without immediate risk to life is classified as “Urgent”; and CHU, WWV, and WWVH are identified as sources of precise frequency and time signals.

Component-Level and Block Diagram Knowledge

One of the largest blocks of new questions probes the internal stages of transmitters and receivers. In an HF station, an antenna tuner may allow an antenna to operate on a band for which it was not designed, and a solid-state final amplifier often requires retuning of the antenna tuner when changing frequency.

FM transmitter stages are examined in greater detail. The microphone converts air pressure changes into an electrical signal, the frequency multiplier generates the output carrier and useful harmonics, and the power amplifier draws the most DC power.

Superheterodyne receiver stages are also addressed individually. The RF amplifier must produce very little noise; the mixer allows detection at a single intermediate frequency regardless of the received frequency; the local oscillator sets the received frequency; the IF filter rejects adjacent-channel signals; the IF amplifier provides the final signal power to drive the detector; and the AF amplifier stage

incorporates both the volume control and the squelch circuit.

For SSB/CW receivers, the function of each block from antenna through AF amplifier is explicitly tested, including the beat frequency oscillator (BFO), which is mixed with the IF to recover the original modulation. SSB transmitter questions cover the fixed RF oscillator, the balanced modulator, the sideband filter, the variable frequency oscillator for frequency adjustment, and the final amplifier, which typically includes SWR protection.

The exam now also expects familiarity with the practical interfaces used for digital modes. Sound card interface functions—analog-to-digital and digital-to-analog conversion, push-to-talk switching, isolation transformers to prevent hum, and integrated audio codecs that eliminate external sound cards—are all detailed.

Power Supplies, Batteries, and Mobile Installation

The station hardware questions move from theory into practical construction and installation. Linear power supply questions cover the transformer's role in voltage conversion and isolation, the location of over-voltage sensing at the regulator output, and the need for a heat sink on the voltage regulator stage. Switching supplies are contrasted with linear types, highlighting the former's reduced size and weight and the latter's lower risk of RF noise generation. Lithium-based batteries are favoured for portable operation because of their high capacity-to-weight ratio. In mobile installations, the fuse must be placed as close to the battery as practical to protect the entire circuit, and heavy-gauge DC wires are needed to minimize voltage drop.

Receiver Characteristics and Digital Modes

The waterfall display presents amplitude and frequency information, while automatic gain control (AGC) limits volume changes despite large variations in signal strength. SSB reception demands tuning accuracy within 100 Hz; too narrow a receiver bandwidth causes loss of information; and dynamic range, together with sensitivity and selectivity, defines communications receiver performance. Digital mode questions explain that any analog information can be digitized, that digital data consist of discrete pre-agreed values, and that FT8's very narrow bandwidth allows dozens of simultaneous QSOs in the space of one SSB signal. FT8 is also identified as the mode that can work at the lowest signal-to-noise ratio in a 2500 Hz bandwidth, and packet radio's automatic repeat request (ARQ) feature is credited with guaranteeing message delivery or notification of failure.

Transmission Lines, Impedance Matching, and Antennas

The velocity factor of coaxial cable is determined primarily by its dielectric material; window line consists of two side-by-side wires embedded in insulation; and a balun is required to connect coaxial cable to window line. Common-mode chokes wound with solid-dielectric coax are preferred because the centre conductor is less likely to migrate and cause a short.

N connectors are moisture-resistant, BNC connectors are standard for low-power and test-instrument use, and a solid outer shield offers the best shielding. Foam-dielectric coax provides lower loss than solid-dielectric types.

High SWR increases line loss, and an SWR meter measures forward and reflected voltage to compute the ratio. Modern solid-state transceivers automatically reduce power when they detect an excessive impedance mismatch.

An end-fed half-wave antenna, with its very high feed-point impedance, can be matched to 50 Ω with a transformer; locating the antenna tuner at the feed point reduces line loss. Yagi antennas achieve multi-band operation through element traps, and their high gain becomes practical on 20 m through 10 m because the shorter elements permit rotation. A horizontal half-wave dipole in free space radiates in a torus, or donut, pattern.

Propagation

Near vertical incidence sky wave (NVIS) enables medium-range HF communications, especially in difficult terrain. On VHF and higher bands, normal tropospheric refraction extends the radio horizon beyond the visible horizon. A higher radiation angle reduces skip distance, and a

double-hop path uses ground reflection to return a wave to the ionosphere.

Multipath cancellation is cited as the reason that moving less than a metre in an urban setting can severely attenuate a 2 m signal. Communication above the local critical frequency is possible because a signal that enters the ionosphere at an oblique angle can be refracted back to Earth, and the maximum usable frequency rises daily as solar UV radiation increases.

Summary

Taken together, the new questions shift the Basic examination toward a more modern operating environment, where digital modes, RF exposure awareness, and integrated station design are part of everyday amateur practice.

The 201 new questions in the 2025 Basic question bank represent a thorough modernization of the Canadian amateur radio examination. They reinforce precise regulatory knowledge, deepen candidates' understanding of transmitter and receiver architecture, and introduce contemporary topics such as digital-mode interfaces, RF exposure metrics, and sound-card-based operating practices.

For anyone preparing for the Basic Qualification examination after July 2025, careful study of these additions is essential. The update makes the Basic qualification not only a test of rules and theory, but also a better reflection of how Canadian amateurs operate today.

~ John VE7TI

The Secret Lagercrantz Suitcase Radio

What counts as portable is somewhat a matter of opinion, especially over the years. The Secret Lagercrantz Suitcase Radio has a portable spy radio of Swedish origin. For its time, it was considered very portable, crammed into a good-sized suitcase.

~ https://hackaday.com/2026/06/12/a-peek-inside-the-secret-lagercrantz-suitcase-radio/

Andy's Ham Radio Linux

A laptop or Pi to support your station on the air

Imagine a Pi with all the software you could ever require to support your POTA or other portable operations… Andy Stewart KB1OIQ 's Linux-based software collection gives amateur radio operators a practical, open-source way to explore digital modes, antennas, CAT contriol, SDR, logging, satellites, emergency communications, and STEM education without getting lost in setup.

A Project Built to Give Back

Andy Stewart, KB1OIQ, presents Andy's Ham Radio Linux as both a convenience package and a community-minded project. Built for amateur radio operators who want to use Linux without spending excessive time on configuration, it gathers useful radio applications into one accessible, free, and open-source collection. The project reflects the shared culture of ham radio and Linux: experimentation, practical learning, and helping others get on the air.

The goal is simple: let operators focus on radio rather than software installation. Andy's Ham Radio Linux organizes dozens of programs into practical categories and turns a supported Linux computer or Raspberry Pi into a ready-to-use radio workstation. Its commitment to open-source software is central. Proprietary programs are avoided so the collection can remain shareable, maintainable, and aligned with the collaborative spirit of both communities.

From Installer to Radio Toolkit

Earlier versions were distributed as full customized Linux images, but the project has since moved to a more flexible installer. Users first install a supported Linux distribution, then run the Andy's Ham Radio Linux installer on top of it. This approach reduces download size, improves maintainability, and supports several Linux flavours, including Debian Live, Ubuntu variants, Linux Mint, and Raspberry Pi OS.

The collection reflects the wide reach of amateur radio. Antenna experimenters can model designs, digital-mode operators can use tools such as WSJT-X, GridTracker, MSHV, and FLDigi, and builders can work with Arduino tools coil calculators, and KiCad. Other applications support propagation, logging, contesting, emergency communications, rig control, satellites, software-defined radio, and tracking.

Practicality is a recurring theme. Andy encourages users to read the "Getting Started" guide, confirm that their Linux version is supported, and use hardware with enough memory, disk space, and reliable internet access. The aim is not to remove the technical character of Linux, but to reduce friction so newcomers and experienced operators can become productive quickly.

Education and Community

The project also has an educational role. The ARRL Teachers Institute uses Andy's Ham Radio Linux as a base for Raspberry Pi systems in STEM-related radio instruction. A dedicated menu helps teachers and students find tools for Arduino programming, SDR experimentation, radio programming, and satellite work.

Community feedback keeps the project moving. Users report bugs, recommend new programs, and help shape future releases. That participation has helped make Andy's Ham Radio Linux a trusted starting point for operators who want Linux-based ham radio tools without building everything from scratch.

The accompanying discussion reinforces Linux's appeal in the radio shack, especially on Raspberry Pi hardware and portable systems. Participants highlight open-source flexibility, update control, and the ability to experiment without depending on expensive or closed software.

Taken together, the presentation and discussion frame Andy's Ham Radio Linux as more than a software bundle. It is a curated bridge between radio and computing, lowering the barrier to experimentation while keeping the focus on the hobby itself.

~ https://www.youtube.com/watch?v=xv9YnREmeAA

To download the latest build, go to http://www.sourceforge.net and search for KB1OIQ

No-ham Recipes

Taco Salad

by HELEN ARCHIBALD VA1YL

Tired of just veggies in your salads? Try this crunchy-topped salad containing cheese, and beef or chicken. It could be a meal in itself.

- 1 pound (454 g) ground beef
- 1 tablespoon (15 ml) powdered taco seasoning
- Tomatoes
- Cucumber
- Lettuce
- Green peppers
- Onion
- Avocado (optional, but good)
- ½ pound (227 g) Cheddar cheese
- ½ package tortilla chips
- Seasoned Salad dressing: ½ Italian, ½ French

Cook the ground beef in frying pan, then add taco seasoning plus 1 cup (250 ml) of water. Cook until the water disappears.

Make a salad with lettuce and the other vegetables. Add the cooked, ground beef and the cheese.

Pour on the salad dressing and toss the salad. Just before serving top with crushed tortilla chips.

For chicken taco salad, replace the ground beef with chopped raw chicken and cook as above adding taco seasoning. Optionally replace the cheddasr cheese with mozzarella.

~

July 2026

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
Event details: SARC—SEPAR 'Live' calendar link All contest information: WA7BNM Contest Calendar: Home **VB7F activation for World Cup continues July 1-19**			RAC Canada Day Contest (CW, SSB)			Coffee: 0700 Denny's King George Blvd. & 68 Avenue OTC Open 0930
5	6	7	8	9	10	11
		1930 SEPAR Net **2000 SARC Net**	**SARC Summer Social (OTC) 1900-2100**		10, 1856: Nicola Tesla born	Coffee: 0700 OTC Open 0930
12	13	14	15	16	17	18
		1930 SEPAR Net **2000 SARC Net**		16, 1961: Leonard Kleinrock publishes concept of packet switching.		Coffee: 0700 OTC Open 0930
19	20	21	22	23	24	25
		1930 SEPAR Net **2000 SARC Net**	SARC Directors Meeting 1900-2100 20, 1897: The Wireless Telegraph and Signal Company is founded in England			Coffee: 0700 OTC Open 0930
26	27	28	29	30	31	
		930 SEPAR Net **2000 SARC Net**				

August 2026

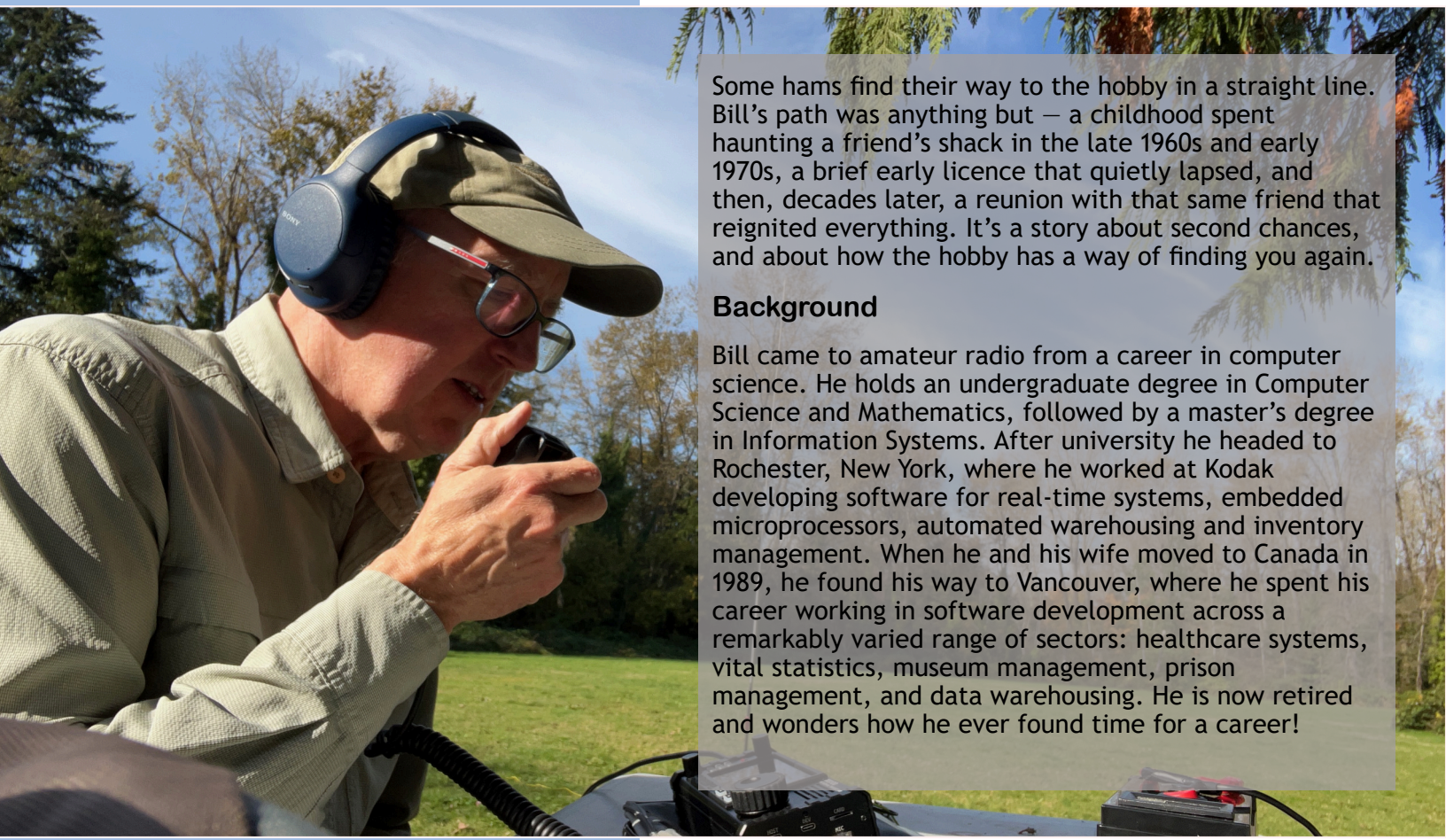
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
	Event details: SARC—SEPAR 'Live' calendar link All contest information: WA7BNM Contest Calendar: Home					Coffee: 0700 Denny's King George Blvd. & 68 Avenue
2	3	4	5	6	7	8
	BC Day	1930 SEPAR Net 2000 SARC Net			7, 1981: FCC establishes General Radiotelephone Operator License, ceases issuing First and Second Class Operator licenses.	Coffee: 0700 OTC Open 0930 WAE DX Contest (CW)
9	10	11	12	13	14	15
WAE DX Contest (CW)		930 SEPAR Net 2000 SARC Nett	SARC Summer Social (OTC) 1900-2100	13, 1912: Radio Act of 1912, titled An Act to Regulate Radio Communication, is approved		Coffee: 0700 OTC Open 0930
16	17	18	19	20	21	22
		930 SEPAR Net 2000 SARC Net				Coffee: 0700 OTC Open 0930
23/30	24/31	25	26	27	28	29
Field Day & Take-down	1904: Edison receives patent for alkaline battery	930 SEPAR Net 2000 SARC Net	SARC Directors Meeting 1900-2100	27, 1910: James McCurdy sends first aircraft-to-ground wireless message		

Radio-Active

Profiles of SARC members

Bill Dorfmann VE7WDO

presented by BLAKE R. WIGGS VA7BWG



Some hams find their way to the hobby in a straight line. Bill's path was anything but — a childhood spent haunting a friend's shack in the late 1960s and early 1970s, a brief early licence that quietly lapsed, and then, decades later, a reunion with that same friend that reignited everything. It's a story about second chances, and about how the hobby has a way of finding you again.

Background

Bill came to amateur radio from a career in computer science. He holds an undergraduate degree in Computer Science and Mathematics, followed by a master's degree in Information Systems. After university he headed to Rochester, New York, where he worked at Kodak developing software for real-time systems, embedded microprocessors, automated warehousing and inventory management. When he and his wife moved to Canada in 1989, he found his way to Vancouver, where he spent his career working in software development across a remarkably varied range of sectors: healthcare systems, vital statistics, museum management, prison management, and data warehousing. He is now retired and wonders how he ever found time for a career!

BILL VE7WDO

How It Started — and Restarted

The seeds were planted early. A close childhood friend was passionate about ham radio, and Bill spent many hours in his friend's shack in the late 1960s and early 1970s. In 1989, the same year he moved to Canada, Bill earned his US Technician licence — but family life and a demanding career quickly took over, and the licence lapsed before he ever really got going. "I never properly launched as a ham," he says, with the kind of honesty that any ham who has experienced the hobby's learning curve along with the pressures of life will recognize.

The rekindling came in 2022, when he visited that same childhood friend (W2DK) and came away with the bug again, properly this time. He enrolled in the SARC Basic course and passed his certification in May 2023. He subsequently sat the US Amateur General exam as well, obtaining a licence on both sides of the border. "Eventually, getting the Advanced certification gave me the privilege of remote operation," he notes, "which has turned out to be more important to my operating than I expected."

The Shack

Bill's primary rig is a Yaesu FT-710, using an end-fed half-wave antenna cut for 40 metres. Living in the city, the noise floor can be quite high, so a couple of years ago he added an amplified receive-only magnetic loop from W6LVP, which made a noticeable difference to his received signal quality.

The shack's most impressive feature may be its remote access setup — Bill's most successful homebrew project. Using FLRig for CAT control, a Node-Red dashboard he built himself for extended rig control, and a DVI-to-HDMI capture dongle that streams the FT-710's full display, including the waterfall, to his computer. "Mumble" is used to route the audio when operating remotely. He can operate his Vancouver station from anywhere in the world. He can even insert "RM Noise" into the audio chain for AI-assisted noise filtering. It's a remarkably complete remote station, and it sees real use: Bill and his wife spend each February and March in New Zealand, and the Vancouver rig comes along virtually.

The newest addition to the shack is a 48-year-old Heathkit SB-221 linear amplifier, acquired because Bill found he could often hear stations that couldn't hear him. "I've yet to get on the air with the SB-221, and have some trepidation about doing so," he admits, "so I've been reviewing my grounding and bonding, adding chokes, etc. (One of these days …)" Any SB-220 or SB-221 owner will nod knowingly.

Bill also created a a homebrewed rotator for the magnetic loop. Made from a rotator cannibalized from a cheap digital TV antenna. He had to 3D print a part for it and asked ChatGPT to write the script for a CAD program called "OpenSCAD" to produce the part.

It's emblematic of Bill's approach: computer skills and radio skills, working together.

On the Air

Bill's preferred bands are 40 metres in the evenings for reliable North American contacts, 20 metres for DX, and 10 metres when propagation cooperates — which, in his experience, is most reliable from fall through late winter. His favourite operating style is rag-chewing: extended, genuine conversations with strangers.

Some QSOs stand out. An early contact was with KL7OW, whose QTH is listed as "Clam Gulch, Alaska" — a blind man who had built a life as a prospector in the Alaskan wilderness. Another memorable moment: discovering, partway through a QSO with a stranger, that the other operator lived just a few houses from where Bill grew up in New York State.

POTA and the New Zealand Connection

One of Bill's great joys is operating outdoors, and he's become an enthusiastic POTA activator. His QRZ page puts it simply: "Activating outdoors is sublime."

Activating in New Zealand has been particularly rewarding. Operating 10 watts SSB on or near the beach, he's regularly amazed by the DX he can work. In New Zealand curious bystanders are asked by Bill where they think they'd end up if they dug a hole straight through the Earth from New Zealand. The answer is Spain — which is exactly where he often finds himself talking to, with 10 watts and the Pacific Ocean behind him acting as a natural ground plane. "The salt water amplifier," as he puts it.

Technology and the Changing Hobby

Bill arrived back at the hobby during a period of remarkable technological change, and as someone who has spent his career in software, he's embraced it enthusiastically.

SDRs have transformed what's possible, and the integration of computing and radio — remote operation, digital modes, software-defined everything — sits at the intersection of his two passions. For instance, Bill recently started using "RM Noise", which is a program that you can feed your audio through, and is sent to be filtered using an AI server elsewhere on the internet. He describes the results as "amazing." "It feels like cheating," he says, "but my hope and expectation is that the AI model will eventually run locally — maybe even inside a transceiver."

"I enjoy building things related to the hobby but am admittedly weak in the area of electronics" he says. "I'll build kits and can understand simple circuit diagrams -hardware is simply not my strong point".

Mastering CW is on Bill's to-do list. "I'm interested in it but haven't become proficient yet," he says — and one of his explicit goals for this year is to get on the air with CW and make it one of his regular operating modes. Satellite communication is also an aspiration for 2026.

SARC and the Community

Bill lives in Vancouver, which puts the OTC and the Saturday Denny's breakfast about an hour away — far enough that in-person attendance is rare. But that hasn't kept him from getting to know SARC's members and appreciating what the club does for the amateur radio community.

Bill is unambiguous about The Communicator: "It's the best amateur radio publication I've seen, and the best publication of any small not-for-profit organization I've ever come across." He notes, with evident pride on the club's behalf, that it has been cited multiple times on the ICQ Amateur/Ham Radio podcast out of the UK.

Beyond the Shack

When Bill isn't in the shack or activating a park, he's likely on a pickleball court, out hiking, reading, or in front of a 3D printer. The printer has frequently contributed to his radio hobby projects. Bill thoroughly enjoys designing objects to 3D print.

Advice for New Hams

Bill's advice to newcomers reflects hard-won experience: "Don't be intimidated by the massive body of knowledge that seems to surround ham radio. Take small steps and enjoy your personal accomplishments. Pretty soon you'll realize you understand more than you thought — and you'll be contributing to that body of knowledge yourself."

"And don't forget to always have a pencil and paper available when on the air!" Bill adds.

He also has a favourite observation about the culture of the hobby: "Hams are patient people — because very few things work the first time you try them or come to fruition as quickly as you'd like. Every ham has that experience. And since instant gratification is rare, we learn to be patient. A corollary is that hams help hams. That's the thing I love most about the hobby."

Ham radio, he'll tell you, is a hobby of a thousand hobbies. There's something for everyone. After a decades-long detour, Bill is proof of that.

~ Blake VA7BWG

May 2026

SARC General Meeting minutes

May 13, 2026

Recording Secretary MIKE PORISKY VE7YEG

Attendance: 21 members/guests attended.

Start Time: 19:00 hrs

Location: Surrey Fire Training Centre

Welcome & Presentation of Agenda - Steve called the meeting to order and gave a brief welcome message.

Guest Presentation

Featured presenter for tonight's meeting was Steve Little VE7LWD. Steve discussed pre-configured RMS Packet Gateway platform in a fully documented, ready-to-deploy system and demonstrated several real-life scenarios. [*See the article in this Communicator]*

Welcome & Call to Order

Following the above presentation, the monthly meeting for May was called to order on May 13, 2026 at 20:12 by President Steve McLean.

Steve displayed the agenda on screen for review.

The following announcements made before starting the reports:

- A reminder that the OTC will be closed next Saturday due to the Fox-hunting event.
- All members should receive a bulletin of current affairs every 2 weeks. If you are not yet on the list, and want to be, send an email to brodiejb@shaw.ca.
- The next Ham class originally scheduled for April 6 has been postponed again due to a low number of students. It is now scheduled to take place in the Fall. The Canvas application previously used may no longer be available.
- John S. is looking for unwanted handheld radios that can be donated to newly certified operators graduating from the high school summer program.
- The SARC annual fox hunt event is scheduled for this coming Saturday. If you plan on attending, please notify Anton. Cost for the meal will be $10 (free for kids under 18).
- Ken Clark is looking for volunteers to help out at this year's Hyack parade on May 23. If you are available to help, contact Ken at VE7BC@gmail.com.
- Gord reminded members that SEA-PAC Convention will take place in a couple of

weeks. This is a great event to learn more about amateur radio and get new equipment with no tax.

- Next meeting (on June 10) will be SARC's Annual General Meeting. Membership fee must be paid prior to the meeting in order to vote. Members were encouraged to pass their proxy to someone if they were not planning on attending. During this meeting, 4 directors will be selected. If you would like to nominate an individual, forward their names to Steve McLean.

Committee Reports

Financial Report - Scott H.

- P&L and Balance sheet (previous month and current) were displayed for review. No specific comments were made about these reports. Scott stated that the year-end review will be done this month and new reports would be available in time for the AGM.
- Several hundred dollars are still in PayPal and need to be transferred.

Nets - Reg N.

- Reg stated that the nets are going great although he is looking for a few 'spare' Net Controllers that would be able to fill in while regulars are on holidays.
- SARC's website continues to get updates on a weekly basis. Reg questioned that perhaps the web site has too many photos, but encouraged members to keep any updates coming. SARC's site is very current, often displaying photos from just a few days earlier. He recently added Dino's microwave project and the high school light modulation project.
- Dino pointed out that the Dubas magazine re-posted his Bulgaria 10-meter project.
- Reg reminded members that there is a UHF net that takes place on the 1st Sunday and a 220 net that runs on the last Thursday of each month. He encouraged everyone to participate.

SEPAR/OTC - Gord K.

- Gord thanked all SEPAR members for joining and participating in related activities over the past year, emphasizing that our involvement helps justify the city's sponsorship of SEPAR.
- John, Gord and Steve had a meeting with the Surrey Fire Chief who proposed that the Fire Department operate the OTC building under their portfolio and sub-lease to SEPAR/SARC. In exchange, SARC members assists the City of Surrey with local community events.
- Steve connected the Hi-Q antenna and controller to verify operation. The antenna will be installed when time permits.
- WinLink and APRS are working at the Concord repeater site.
- Invitations have been sent to city VIPs and government officials, inviting them to visit during Field Day. Several have already replied that they will be visiting Saturday afternoon.
- The mayor of Surrey signed a Proclamation of Amateur Radio Week in celebration of Field Day.
- Related to the interface between SEPAR and the emergency services, Daryl asked how SARC would communicate with the fire department during a disaster event? Gord explained that communications would be through a member operation out of Firehall No. 1.

Membership - John B.

- Current membership is 156 with 6 new members signing up this month and 16 new members since January 1.
- John re-introduced long-time member George Merchant (VA7GM)
- Membership renewals are now due and must be paid in order to vote in next month's election. Watch for the notice in the weekly bulletin. Membership renewal can be made by e-transfer to payments@ve7sar.net. Proxy forms are also available on the website.
- Sheldon (VA7XNL) asked how many memrs needed to be present to obtain a quorum for the AGM and suggested that payment not be encouraged until after the meeting in order to easily meet the quorum number. John pointed out that a sufficient number of members have always shown up in the past.

Contests - Mike P.

- Mike reviewed the one contest that was completed since the last meeting: Yuri Gargarin Cup Contest. This was a CW & SSB contest on all bands, however a combination of poor propagation and other contests taking

place at the same time resulted in minimal QSOs.

- The CQ WW WPX DX, (CW) contest is scheduled for May30/31. A call for participants will go out around May 20.
- Field Day will take place on June 27/28 and the Canada Day contest will follow on July 1.

Basic Class - John S.

- The next class has been rescheduled until the fall.
- The high school RF course continues to work through the course material. The semester is about half way through.

Old Business

- SARC had 2 tables at the Maple Ridge Swap Meet on May 10. The total earnings were $406 less $70 for the costs of tables and staff. Additional income of $600 is expected with the sale of a radio and amplifier following the event, provided the equipment is confirmed to be working.

Mike (VE7YEG)

- Mike presented a summary about the plans that are underway to organize this year's field day which will take place on Saturday, June 27.
- The location this year will be Spectrum Flyers Field located at approximately 48 Ave and Hwy 15.
- We are hoping that all SARC members can stop in to participate in the activities. Things will get started at approximately 9 am Saturday morning and continue through the night with the Field Day radio contest.
- Lunch will be provided Saturday afternoon if we can convince a few volunteers to help out. We are also planning a couple of demonstrations and presentations.
- We will soon be looking for volunteer commitment to assist with the following activities:
  - *5-10 members to help set up the big-foot antenna on Friday (June 26),*
  - *2-3 people to plan and deliver the Saturday lunch,*
  - *1 trailer-towing truck to bring out the SEPAR Trailer Saturday morning ,*
  - *Coordinator to organize this year's children's activity, and lastly,*
  - *Help taking down the Big-foot antenna on Sunday afternoon.*

New Business

- Due to the shortness of time, all new business was deferred to the next meeting.

Adjournment:

Steve made a motion to adjourn the May board meeting at 21:08. Seconded by Shawn Dooley (VA7BD). Motion carried.

Seconded by Andrew E. Carried.

~ Minutes taken by Mike Porisky VE7YEG

Powerful websites you should know https://tinkered.ai/

Describe what you want to build. Tinkered generates the firmware, wiring, and build guide — then simulates everything in 3D before you touch a single wire. Describe what you want your hardware to do. Tinkered generates the firmware, wiring diagram, parts list, and step-by-step assembly guide — all in seconds… at a price.

June 2026

SARC 2026 Annual General Meeting minutes

June 10, 2026

Recording Secretary MIKE PORISKY VE7YEG

Attendance: 33 (refer to Sign-in sheet)

Start Time: 19:00 hrs.

Location: Surrey Fire Training Centre

Prior to the start of the AGM, John Brodie reported that we had 31 voting members plus 4 proxies present, out of 116 paid members, thereby forming a quorum for this meeting.

Welcome & Call to Order

With the above quorum available, the SARC 2026 Annual General Meeting was called to order on June 10, 2026 at 19:08 by President Steve McLean.

Steve displayed the agenda on screen for review and reminded members that the minutes of the 2025 AGM were available online. He asked if there were any questions regarding previous minutes and hearing no comments, requested that the minutes of the previous AGM be adopted. Rob G. seconded. Motion passed.

Committee Reports

Financial Report - Scott H.

- The Profit & Loss Statement, effective May 30, 2026 was displayed to members. Scott pointed out that it was lower than last year due to several higher expenses; specifically repairs to SARC's 105 ft antenna tower and the purchase of a 5-band beam antenna.
- Other expenses were on par with last year.
- Most items have now been fully depreciated resulting in minimal deductions going forward.
- Members can request a copy of the financial report by contacting treasurer@ve7sar.net
- Scott reviewed the status of our accounts.
- Steve moved to adopt the financial statement as shown. Scott T. seconded with majority voting in favor. Motion carried.

Announcements

Steve indicated that the Field Day discussion, previously under Old Business would be discussed in detail after the AGM, during the June monthly meeting.

SEPAR/OTC

- Steve, Gord and John B. worked with the City of Surrey over the past several months to firm up a contract regarding the use of the OTC by SARC.
- Effective immediately the Surrey Fire Dept. will take over the land including the OTC building and SARC will become a tenant. The Fire Dept. will assume all repairs and maintenance costs (excluding SARC's space inside the radio room).
- SARC will maintain our own equipment in the radio room and the externally mounted antennas.
- The building and land are offered to SARC at no cost in exchange for the emergency response services that we agree to provide to the city when requested.
- Steve explained the difference between SARC's previous lease arrangement and the new tenant agreement.
- Gord reminded all members to consider joining SEPAR as well as to volunteer for city-run events such as parades and Run-Surry-Run.
- The Fire Chief was invited to Field Day to witness SARC members in action.

Membership – John B.

- Total count of members on the roster is 168 with 116 having paid prior to the start of the AGM – total mebership is 6 more than last year at the same time.
- John will send out more reminders to those that have not renewed over the next 2 months. If still not paid by September, those names will be removed from the membership roster.
- There are 42 provisional members on the list. (13 from the January 2025 basic course and 29 from the April 2025 class. These individuals will be given one more chance to renew before being removed.
- The additional 61 names from the January 2026 class will be retained on the membership list until this time next year, at which time they will have the opportunity to become paying members.
- John summarized the membership growth pattern by explaining that SARC typically loses about 20 members at the start of each year but then gains approximately 25 during the year, resulting in continual growth of the club.

Year-end Review

Steve presented a series of slides that highlighted many of the activities that SARC members participated in this year. They included:

- A 4-month long RF course at Kwantlen School, taught to high school students by John Schouten and Adam Drake,
- Dino's installation of SARC's 24 GHz beacon on the Concord tower,
- Antenna building workshop included in the basic ham class,
- Two hardware project -building a DigiPi interface and a NTP Clock,
- Run-Surrey-Run 5 & 10 k road race,
- Weekly breakfast meetings at Denny's Restaurant,
- Fox-hunting event at Crescent Park,
- Installation of AREDN equipment at the Concord site,
- Thirteen contests to test our effectiveness in long-range communications,
- Steve also recognized Reg's (VA7ZEB) time spent building a new website for SARC, and the constant additions made throughout the year.
- Lastly, Steve recognized the work that Horace (VA7XHB) did on SARC's repeaters this past year.

Basic Class – John S.

- One basic course took place this year with new content and several new instructors. 65 students completed the classes with many writing the exam to obtain their certificate. The next class is planned for September, but the Canvas software used to manage

students and content may no longer be available. John is hoping that news about the free application will be released shortly.

- This year Adam Drake took his successful summer school project up a notch and created a 17-week Radio Frequency Communications course for 30 high school students. John Schouten presented the course material covering all ISED topics resulting in 8 students (so far) obtaining their Amateur Radio certificates.
- John thanked Erika VA7ISI for her help working with the students during communication exercises.
- Students who have graduated are already joining local nets.
- It is expected that the course will take place again next year.
- John is looking for donations of Handheld radios that can be given to students passing the exam.
- The Communicator site no longer allows the free tracking of distribution by countries.

Election of the Board

- Gord Kirk assumed the Chair position to conduct the election of 4 board members.
- He explained the process that would be followed and listed the 5 members who were nominated prior to the meeting. Gord then asked for nominations from the floor. After 3 calls, no new names were added to the list. The 5 candidates introduced themselves and stated why they were running for the board position.
- All eligible members cast their vote and following the count by 2 separate scrutineers, the 4 positions were filled by:
  1. John Brodie
  2. Andrew Elgin
  3. Doug Jeffery
  4. Scott Thomas
- Gord made a motion to destroy all ballots. Seconded by Rob G. VA7CZV. Majority supported. Motion carried.

Steve M. resumed as the meeting Chair and asked for any new business. Nothing received.

Adjournment

Steve made a motion to adjourn the 2026 SARC AGM at 19:53. Seconded by Scott H. Carried.

~ Minutes taken by Mike Porisky VE7YEG

June 2026

SARC General Meeting minutes

June 10, 2026

Recording Secretary MIKE PORISKY VE7YEG

Attendance: 33 members/guests attended.

Start Time: 20:11 hrs

Location: Surrey Fire Training Centre

Welcome & Presentation of Agenda - Steve called the meeting to order and gave a brief welcome message.

Welcome & Call to Order

The SARC Monthly Meeting was called to order on June 10, 2026 at 20:11 by President Steve McLean.

This meeting will focus on Field Day planning and address several new business items.

2026 Field Day – Mike Porisky

- Mike presented a summary about the plans that are underway to organize this year's field day which will take place on Saturday, June 27.
- The location this year will be Spectrum Flyers Field located at approximately 48 Ave and Hwy 15. A map was displayed emphasizing that access could only be made coming from HWY 15, West on 48 Ave.
- SARC will operate as a Class 3A station with one CW radio, one SSB radio and one FT-8 configured radio.
- We will also operate 1 GOTA radio on the HF bands as well as a Winlink station for demonstration purposes. Jeanne Wilson VA7QD has agreed to work with new operators on the GOTA radio.
- Two options for meals were proposed and the members voted for Chinese food that will be brought in for about 17:30 during the event on Saturday afternoon. Nell and Ralph have volunteered to take on the meal preparation.
- The site layout was displayed, showing that 2 towers will be erected with an OCFD wire connected between them. This will provide access to the following 5 bands: 10m, 15m, 20m, 40m, and 80m. Filters and triplexer will be available to support 4 radios running at the same time.
- VIP invitations have been sent out and we are expecting visits from the fire department, police department, local, provincial and perhaps federal politicians as well as the news media.

- Things will get started at approximately 9 am Saturday morning and continue through the night with the Field Day radio contest.
- Signup sheets were made available at the front of the room for members to volunteer with setting up the antennas and radios the day before. Starting at 12:00 Friday afternoon and finishing around 5 pm. Pizza will be brought in for those that help with the setup.

FIFA Special Event – John Schouten

- Special callsigns have been set up to recognize the 3 Canadian cities that are hosting the FIFA World Cup games. Vancouver will use VB7F. Anyone that would like to activate the callsign for a one-hour period can contact John S. or send an email to contesting@ve7sar.net Currently there are four, 1-hour periods starting at 10 am Saturday, June 20th. More periods can be obtained if there is a demand.
- For those interested in hunting and not activating, if you make 3 or more contacts (different operators, bands or modes), you will receive a QSL card following the event.

September Fox Hunting – Les Tocko

- The Chilliwack Radio Club has expressed interest in a fox-hunting event this Fall; perhaps the September timeframe.
- Les will build and donate 5 transmitters to the Chilliwack club and John Brodie sold them 10 receivers.
- Les suggested that SARC organize a project where members build a VHF attenuator for their radio along with a Yagi antenna for participating in VHF fox hunting.
- A quick head count was taken as a show of interest with 5-6 wanting to participate.
- Andrew E. recounted his experience working VFH equipment during SARC fox hunting event last month.

Changes to Antenna Height – Steve McLean

ISED is considering changes to the approval procedure for antennas up to 15 meters (49 ft). Proposed updates could affect height exemptions, consultation zones, and the approval process for amateur installations. Anyone interested in providing feedback should visit ISED website: https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/learn-more/key-documents/consultations/consultation-amendments-tower-siting-process-and-decision-roaming-tower-sharing-and-annual-reporting

Other business

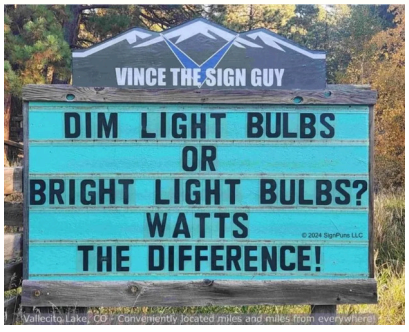
- Shawn Dooley VA7BD has agreed to take over the distribution of QSL cards.
- Reg N. VA7ZEB is looking to add a few more net control operators that could temporarily fill in for operators on vacation. John VE7ZFR and Elizabeth VE7ELA both offered to help.
- Andrew Elgin VA7LGN and Horace Bong VA7XHB will both share responsibility for maintaining SARC repeaters .

Adjournment

Steve made a motion to adjourn the May board meeting at 20:56.

Seconded by Andrew E. VA7LGN Carried.

~ Minutes taken by Mike Porisky VE7YEG



CITY OF SURREY
the future lives here.

Proclamation

Amateur Radio Week

June 22 – 28, 2026

WHEREAS Amateur Radio operators are celebrating the miracle of the human voice broadcast over the airwaves occurring over a century ago; and

WHEREAS The City of Surrey has many volunteer licensed Amateur Radio operators who have demonstrated their value by providing radio communications during emergencies and public service events; and

WHEREAS This year's Amateur Radio Field Day exercise will take place on June 27 and 28, 2026, this is a 24-hour emergency preparedness exercise and demonstration of Radio Amateurs' readiness to provide self-supporting communications without the need for additional infrastructure;

NOW, THEREFORE, BE IT RESOLVED that I, Brenda Locke, do hereby declare June 22 - 28, 2026 as "Amateur Radio Week" in the City of Surrey.

Mayor Brenda Locke
City of Surrey

SURREY AMATEUR RADIO

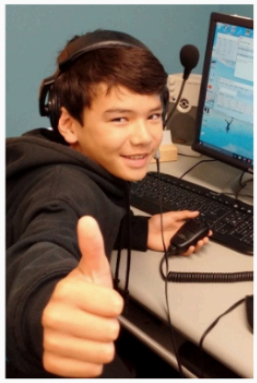
basiccourse

OBTAIN YOUR FEDERAL AMATEUR RADIO CERTIFICATE

8-WEEKS · ON-LINE · $80

contact SARC@VE7SAR.net for the next course start date

Includes classes, a comprehensive manual, videos and the exam fee



- **Ideal for outdoors activities. Long range communications anywhere for free without commercial infrastructure**
- **Use satellite communication to speak around the world, perhaps even to an astronaut**
- **Participate in 'Radio Sports' like Contesting and Hidden Transmitter Hunts**
- **Enhance your personal and your community's preparedness in an emergency**
- **Use a radio, computer, smartphone or tablet for free worldwide digital communications**
- **Practice an exciting hobby or start a career opportunity**

City of Surrey
separ
Surrey Emergency Program Amateur Radio
https://separ.ca/

Our Radio Courses

SARC
Surrey Amateur Radio Communications
http://ve7sar.net

Recent Photos

Just to let you know the 10 GHz beacon is up and running in Bulgaria since yesterday.

Here are some pictures and audio from Romania, 202 km away, where it was received.

The slot antenna that the club donated is performing very well, 6.000 ft ASL on top of the mountain!

73

Dino VE7NX

Scenes from the RF Communications semester course at Kwantlen Secondary School in Surrey
SARC members providing demonstrations of the various aspects of Amateur Radio

Where the Communicator is Read

Reprint Policies

The Communicator is a bi-monthly journal about amateur radio, and other relevant topics, published by Surrey Amateur Radio Communications (SARC) and it may be freely distributed. Reprints are often requested and these are our policies for re-publication of articles.

This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. All rights are reserved.

While this publication is distributed free of charge, all content, including text, images, graphics, and other materials, are the property of the respective authors and creators and is protected.

You may use articles authored by SARC members for your club newsletter or other amateur radiol publication, provided that the purpose is non-commercial, you credit the author, and provide a link as follows: https://ve7sar.blogspot.com/search/label/SARC%20Communicator. If our article indicates it is from a source outside of SARC, we cannot transfer that right, and you must seek permission to re-publish from the original source. We appreciate being notified via email to communicator@ve7sar.net if one of our original articles has been re-printed elsewhere.

We welcome your comments and feedback

The views expressed in this publication are those of the individual contributors.

Please consider leaving a comment via email to communicator@ve7sar.net, or on our blog site https://ve7sar.blogspot.ca or, better yet, contact our authors directly, so they know someone is out there reading their work in our publication.

2026 Canada

by DOUG JEFFERY VA7JDJ

Having barely put away the gear from our Field Day adventure last weekend we dive into the Radio Amateurs of Canada (RAC) Canada Day Contest. Celebrating the 159th anniversary of Canada's Confederation this contest is focused on Canadian amateur operations. The most valuable contacts that you can make in this competition are with the stations in each province that have been assigned the RAC callsigns (i.e. VE7RAC). Connect with one of these and you score 20 points. Contact any other Canadian station and receive 10 points for each. All other contacts count for 2 points each. Additionally, there are multipliers for every province worked on every band (2m, 6m, 10m, 15m, 20m, 40m, 80m, 160m) and for each mode (CW or phone).

Participants can choose from a variety of categories depending on the number of operators, the number of bands that will be used, output power, the number of radios etc. We opted to use 2 radios limited to 100W with multiple operators.

Surrey Amateur Radio Communications

Day Contest

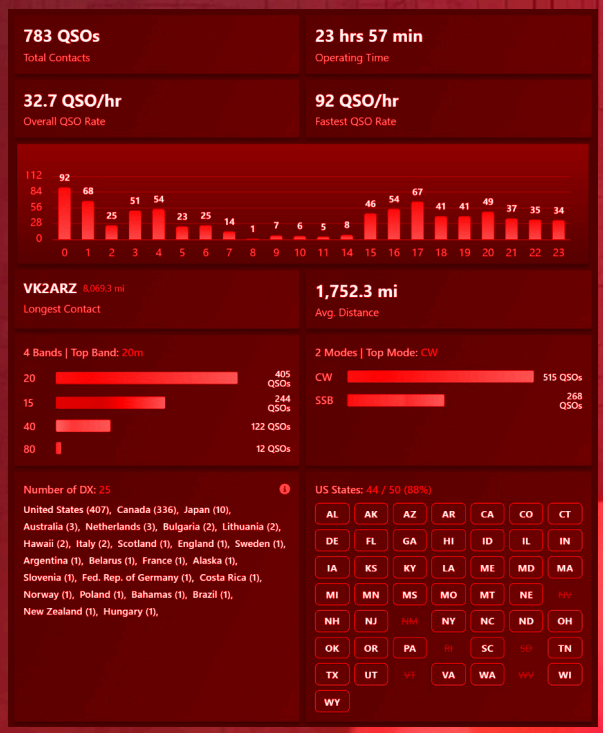
We had a few technical issues with switching antennas between radios and getting N1MM+ configured properly to be able to use the function keys to automate CQ calls on one of the radios. This led to operators having to make all CQ calls instead of using a recording.

On July 1st this contest runs for 24 hour from 0:00:00 to 23: 59:59 UTC, or 5PM to 4:59:59 local time. Our first operators reported that the conditions were less than ideal. We persevered through the evening and into the wee hours of the morning. We took a couple hours out from the contest and started operating again at 7AM. A strong finish brought us up to a total of 783 QSOs. 515 were made by CW with the remaining 268 on phone. The longest contact was with VK2ARZ for a distance of 12985km / 8069 miles.

I cannot think of a better way to celebrate Canada's 159th birthday. Happy Canada Day!

73

~ Doug VA7JDJ


783 QSOs
Total Contacts
23 hrs 57 min
Operating Time
32.7 QSO/hr
Overall QSO Rate
92 QSO/hr
Fastest QSO Rate
112
84
56
28
0
92 68 25 51 54 23 25 14 1 7 6 5 8 46 54 67 41 41 49 37 35 34
0 1 2 3 4 5 6 7 8 9 10 11 14 15 16 17 18 19 20 21 22 23
VK2ARZ 8,069.3 mi
Longest Contact
1,752.3 mi
Avg. Distance
4 Bands | Top Band: 20m
20 405 QSOs
15 244 QSOs
40 122 QSOs
80 12 QSOs
2 Modes | Top Mode: CW
CW 515 QSOs
SSB 268 QSOs
Number of DX: 25
United States (407), Canada (336), Japan (10), Australia (3), Netherlands (3), Bulgaria (2), Lithuania (2), Hawaii (2), Italy (2), Scotland (1), England (1), Sweden (1), Argentina (1), Belarus (1), France (1), Alaska (1), Slovenia (1), Fed. Rep. of Germany (1), Costa Rica (1), Norway (1), Poland (1), Bahamas (1), Brazil (1), New Zealand (1), Hungary (1),
US States: 44 / 50 (88%)
AL AK AZ AR CA CO CT
DE FL GA HI ID IL IN
IA KS KY LA ME MD MA
MI MN MS MO MT NE NV
NH NJ NM NY NC ND OH
OK OR PA RI SC SD TN
TX UT VT VA WA WV WI
WY

Field Day 2026

From two perspectives

By GORD KIRK VA7GK

Gord Kirk VA7GK
is a SARC Director
and the City of Surrey
SEPAR Coordinator

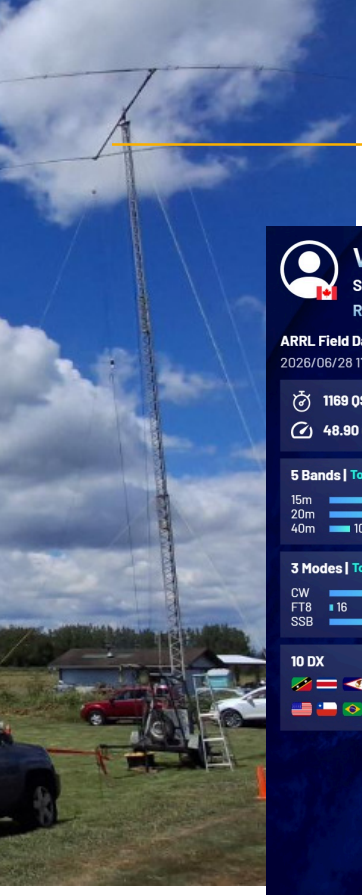
SEPAR

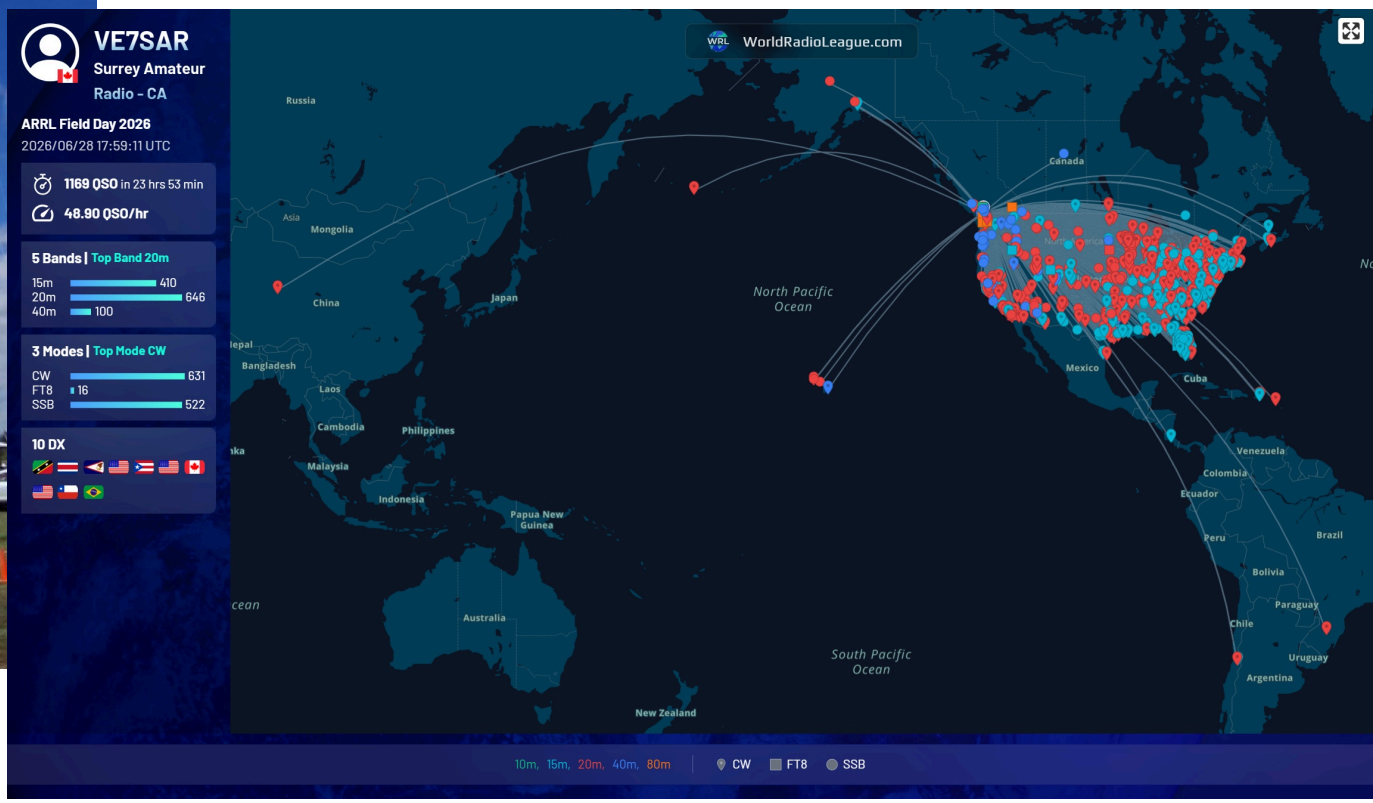
An emergency program perspective from the field

Field Day 2026 is now complete. The equipment has been taken down, returned to its usual place, and another successful exercise is in the books.

This year, SARC members decided to return to "the Field." Over the past several years, we have used our Operations Training Centre, which serves as a backup radio room for the City's EOC radio room at Fire Hall 1. In previous years, we have operated on backup power and supported a large GOTA program, among other activities. This year, we were able to arrange a site in the middle of the city, in a large farming area. The location was quiet and had a low RF noise floor, but it also came without infrastructure support. We camped in a field, set up our antennas, ran generators, and brought our own water and supplies.

From SEPAR's perspective, it was a true, full-scale, 24-hour exercise. Everything had to be brought in, set up, operated, and then taken apart. The SEPAR trailer was brought to the site, along with the club's 110-foot "Bigfoot Tower" and another borrowed, trailer-mounted telescoping tower. Several of us discussed how valuable it is for emergency programs to participate and practise during Field Day and similar events. At the same time, citizens of Venezuela were dealing with the after-effects of a massive earthquake. The Radio Amateurs of Canada (RAC) and the U.S. ARRL asked amateurs to keep certain frequencies clear so they could be used to support the response in Venezuela. Our Field Day this year was a strong example of what it would be like to operate without infrastructure and still find a way to get set up and communicate.





Another important purpose of Field Day is to promote amateur radio and educate our community and community leaders about its role. Each year, SARC/SEPAR members invite local politicians, emergency responder leadership, and the public. Our editor of The Communicator prepares and sends out an information package and invitations. As the SEPAR coordinator, I follow up with Emergency Program leadership to encourage their attendance and help demonstrate what we can provide during a disaster. Our city council has been supportive over the years, including declaring Amateur Radio Week in the city to cover the Field Day weekend.

This year, the city helped advertise the event on its website as one of the free activities taking place over the weekend. We had two city council members attend, along with the general manager of the newly formed public safety department, several on-duty fire crews, a battalion chief, and the deputy chief of emergency programs. A local reporter also stopped by to see the event and interview several participants for a local news story. We were pleased to welcome a representative from the Province's Emergency Management and Climate Readiness (EMCR), who helps support the provincial volunteer radio programs. We were also privileged to have the BC/Yukon Radio Amateurs of Canada representative visit. Several members of the general public and some neighbours also stopped by, rounding out our list of guests.

As part of our "exercise," we had a safety officer, sign-in and sign-out lists for participants and guests, a station manager responsible for radio operations, a first aid plan, and, most importantly, a food plan. Each of these areas is just as important to the overall plan as running the radios. We also had a public display table and a GOTA station so visitors could try the radios themselves. It was especially rewarding to see students from the recent high-school electronics program attend and have the chance to try HF radio.

From the Volunteer Emergency Program (SEPAR) perspective, the results of this Field Day were excellent. It was personally very rewarding to see the team come together so well through planning, setup, event operations, and demobilization. It made all of the background work worthwhile.

~ Gord VA7GK

More photos

SARC

Months of planning, a true off-grid site, committed volunteers, and 1,168 contacts made SARC's first truly "in-the-field" Field Day since COVID a memorable success.

To the casual observer, SARC Field Day 2026 may have looked like a 24-hour operating event running from 11:00 a.m. Saturday to 11:00 a.m. Sunday. In reality, it was the visible result of months of planning, organizing, testing, hauling, troubleshooting, and teamwork. This year's event marked SARC's return to a true field operation, away from the Operations and Training Centre and into conditions that more closely resembled a real emergency communications deployment.

More Than a Contest

Field Day is an annual event sponsored by the Radio Amateurs of Canada (RAC) and the American Radio Relay League (ARRL), held on the fourth full weekend in June. It is part emergency communications exercise, part public demonstration, and part operating challenge. Compared with most radio contests, Field Day feels a little like a treasure hunt combined with a radio contest: operators make contacts on the air while also earning points for activities such as running a Get On The Air (GOTA) station, generating publicity, demonstrating emergency readiness, and engaging the public.

For the past several years, SARC had operated Field Day from the Operations and Training Centre. This year, the club decided to get back out into the field. Several locations were considered before the Spectrum site in Cloverdale was selected. It offered exactly the kind of challenge the team was looking for: no power, no internet, no indoor plumbing, and not a condo tower in sight. In short, it was a true test of the club's ability to operate under conditions that could resemble a real emergency.

Planning the Operation

Once the location was settled, the planning team dug into the rules to determine what equipment and setup would give SARC the best opportunity for a successful event. CW and phone stations were assigned to the Icom 7610 and Flex 6600 respectively. Building on a successful 2025 trial, the team also added a digital FT8 station, with Horace VA7XHB setting up a computer running WSJT-X and pairing it with the Kenwood TS-480. The final radio, an Icom 7000, was set aside for the GOTA station to give new

1169 QSOs
Total Contacts
23 hrs 53 min
Operating Time
48.9 QSO/hr
Overall QSO Rate
110 QSO/hr
Fastest QSO Rate
132
99
66
33
0
47 42 80 110 67 27 21 17 2 10 9 1 39 62 41 76 67 101 53 73 48 57 37 82
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
PY3TD 6,873.5 mi
Longest Contact
1,536.0 mi
Avg. Distance
5 Bands | Top Band: 20m
20 646 QSOs
15 410 QSOs
40 100 QSOs
80 10 QSOs
10 3 QSOs
3 Modes | Top Mode: CW
CW 631 QSOs
SSB 522 QSOs
FT8 16 QSOs
Number of DX: 10
United States (1096), Canada (56), Alaska (4), American Samoa (3), Puerto Rico (3), Hawaii (2), Chile (2), St. Kitts & Nevis (1), Costa Rica (1), Brazil (1),
US States: 49 / 50 (98%)
AL AK AZ AR CA CO CT
DE FL GA HI ID IL IN
IA KS KY LA ME MD MA
MI MN MS MO MT NE NV
NH NJ NM NY NC ND OH
OK OR PA RI SC SD TN
TX UT VT VA WA WV WI
WY

and less-experienced operators a chance to get on the air.

Knowing that the operation would rely on battery power and a generator, the team operated low-power, limiting maximum output to 100 watts. A portable 3000-watt Honda generator supplied power throughout the event, while battery boxes from the OTC ran the 12-volt equipment and were kept charged from the generator. The SEPAR trailer was also connected to the generator, creating a practical and reliable power setup for the full 24 hours.

No Internet? No Problem.

Although amateur radio works without the internet, contest operators have grown used to being online to monitor scores and network logging computers. The original plan was to use the Amateur Radio Emergency Data Network (AREDN), linking from a temporary node at the Field Day site to SARC's North Repeater site on Concord tower, about 12.5 kilometres away. The team hoped to bring that connection into an AREDN router and network the computers running N1MM+ logging software.

The AREDN link, however, proved too weak to support a stable connection. The computers could see one another, but they could not reliably reach the internet. A cellular hotspot was configured as a backup, but it failed after several minutes for reasons not yet understood. In the end, the team operated without the benefits of an internet connection. No internet—no problem.

Towers, Antennas, and Weather

The largest part of the setup was getting the antennas in the air. After discussion, the team chose to run two 65-foot/20-metre towers. Dale VE7GL generously allowed SARC to use his 40-metre beam and portable tower, which Les VA7OM delivered from Maple Ridge. On SARC's own "Bigfoot" tower, the team mounted a multiband Yagi for 10, 15, and 20 metres. An end-fed antenna strung between the towers covered 80 metres. Both Yagis were pointed southeast, and the towers were arranged so the wire antenna would also radiate efficiently in that direction.

A hardy group of volunteers arrived Friday at 11:00 a.m. to deploy and test the entire setup. Mother Nature added a few showers and some wind, just to make sure everyone was committed. By late Friday afternoon, the stations were largely ready, though one more surprise appeared when the coax going to the Bigfoot tower began showing very high and unstable SWR. Fortunately, the issue was traced to the cable between the tower and the triplexer, avoiding the need to lower the tower to replace a cable.

On the Air

Saturday morning brought improved weather, with blue skies and a few clouds. As the team brought up the network and radios, they discovered that the GOTA station computer was running a different version of N1MM+ than the other three computers. A quick download over a cellular hotspot and an update solved the problem, and from there Field Day ran well. Propagation was among the poorest seen in recent memory, but it was still good enough to keep the radios busy and the operators engaged.

More than 30 SARC members participated, joined by 38 visitors and representatives from several agencies. The day included activities to introduce FT8 operations, an active GOTA station, and many opportunities for visitors to see emergency-ready amateur radio in action. Jason VA7YUU and Valentin VE7ZFR worked the GOTA station hard under the watchful eye of Jeanne VA7QD, who coached new contest participants. Sheldon VA7XH assisted newer operators on the contest stations, while Horace VA7XHB and Doug VA7JDJ supported FT8 operations.

Throughout the day there were plenty of smiles, stories, and contacts—both in person and on the air. Dinner was brought in for those on site in the late afternoon, and as evening settled in, a few hearty operators stayed through the chilly night to keep the score building. On Sunday morning, Ralph VA7UB and Nell VA7PE arrived with an excellent pancake breakfast for the overnight crew, a much-appreciated treat after a long night in the field.

Visitors and Community Support

Field Day also served as an important public demonstration of emergency communications capability. Visiting representatives included

- Anna Burns – Surrey Leader Now Newspaper
- Linda Annis and Rob Stutt – Councillors, City of Surrey
- Deputy Chief Shelly Morris – Surrey Fire Services
- Battalion Chief and 3 engine crews – Surrey Fire Services
- Brian Edwards – General Manager Surrey Public Safety
- Hiroshi Takahashi – BC Yukon Regional Director, Radio Amateurs of Canada
- Stephen Kern – Emergency Management Technician South West PREOC, Ministry of EMCR

Our event was given much-appreciated publicity in 3 newspaper articles: https://voiceonline.com/surrey-radio-volunteers-to-demonstrate-disaster-ready-communications/ and https://www.surrey.ca/news-events/events/amateur-radio-week and https://surreynowleader.com/2026/06/27/surreys-ham-operators-put-their-emergency-communication-skills-to-the-test/ and Surrey Council provided additional support with their official Proclamation of Amateur Radio Week [Page 110].

That public recognition helped reinforce Field Day's broader purpose: showing how amateur radio operators can provide resilient communications when conventional systems are unavailable or overloaded.

~ Doug VA7JDJ and John VA7XB

We're QRT

Has Ham Radio Lost Its Soul?

VK9DX had some thoughts… so have I

by JOHN SCHOUTEN VE7TI

Nick Hacko VK9DX is one of ham radio's most colourful voices: an elite contester, watchmaker, refugee-turned-builder, and unapologetically opinionated character who somehow manages to be equal parts philosopher and entertainer. Operating from Norfolk Island—a tiny speck in the South Pacific with a population of just 2,000—Nick joins Kevin Thomas W1DED of Q5 Ham Radio for a conversation that ranges from Cold War-era Yugoslavia to CQ WW strategy, remote island station building, and why contesting still matters in an increasingly automated world.

Nick traces his ham radio roots back to the golden age of Yugoslav contesting, where domestic 80-meter battles were treated with the intensity of world championships. After fleeing the Balkan conflict in the early 1990s, he chose Australia over Canada for one simple reason: ham radio. Decades later, during the COVID lockdowns, he bought property on Norfolk Island sight unseen and moved there with little more than an IC-7300 and a wire antenna. What followed was a one-man effort to build a serious contest station under extreme logistical constraints, shipping delays, antenna height limits, and near-total self-sufficiencThe commentator frames the question as a concern about whether ham radio has become more about status, gatekeeping, and routine habits than experimentation and connection. The video's title and snippet suggest the host is reflecting on ham radio's "golden" roots and contrasting them with an increasingly automated, modern version of the hobby.

What the video seems to argue

The core complaint is that some longtime operators can be unwelcoming to newcomers, which can make the hobby feel closed off rather than collaborative. It also seems to suggest that modern alternatives like the internet, digital platforms, and newer radio activities have changed what people expect from communication hobbies.

What still gives ham radio value

The video does not present ham radio as dead; instead, it appears to defend the parts of the hobby that remain "magical," such as building your own station, making contacts through radio alone, and the challenge of contesting. In that sense, the argument is less "ham radio is over" and more "the hobby needs to remember what made it meaningful."

As the editor of this publication, I encounter plenty of opinions about amateur radio—where it has been and where it is going. Some predict doom and gloom. Many see it flourishing with new technology, the coming impact of artificial intelligence (AI), and the habits of younger generations.

As course coordinator/instructor of our popular on-line courses and instructor of the amateur radio component of our high school RF Communications course amateur radio component, I can attest that Amateur radio is not dead. It is changing, and that change is not a threat to the service's future so much as proof that the service is still alive, still adaptive, and still capable of attracting people who value it for very different reasons.

The strongest argument for amateur radio has always been its breadth. It is not one, but many interests under one license. For some people, it is all about long-distance HF contacts and chasing rare DX. For others, it is VHF and UHF local communication, repeaters, emergency preparedness, satellites, weak-signal work, digital modes, portable operation, antenna building, microwave experimentation, APRS, contesting, mesh networking, homebrewing, and public service. There are also operators who love the technical side more than the operating side, and others who love the operating side more than the technical side. That diversity is not a weakness. It is the reason amateur radio has survived for so long.

That broadness matters because it means there is room for everyone's niche. The service should never be treated as though one operating style is the "correct" one and all others are lesser. A person who enjoys ragchewing on HF is part of the service. So is the operator who spends weekends building antennas, the digital experimenter who integrates radios with computers, the homebrewer who designs circuits, the emergency communicator who keeps a go-kit ready, and the student who learns by decoding signals on a laptop. Amateur radio has always been healthiest when it welcomes many reasons for being involved, not just one.

That point becomes especially important when thinking about younger generations. Many older amateurs came to the service through a world where radio was one of the few ways to communicate over distance, where technical experimentation was harder to access, and where the excitement of making a contact across the country or across the ocean was a revelation. Younger people grow up in a world where instant global communication is already assumed. To them, the fact that a radio can carry a voice across thousands of miles is interesting, but not always enough by itself to make the hobby feel relevant. They often respond more strongly when radio is presented not as a relic, but as a platform for experimentation, coding, signal processing, networking, automation, and software-defined systems.

That is not a sign that younger people are less interested in radio. It is a sign that they expect technology to be integrated. They live in an environment where phones, laptops, cloud services, sensors, microcontrollers, and wireless systems are all part of one digital ecosystem. When amateur radio meets them there, it becomes more accessible and more compelling. A transceiver controlled from a computer, a digital mode decoded on a screen, a satellite contact tracked with software, or a station managed through a home network speaks their language more naturally than a purely analog presentation of the hobby. The future of amateur radio depends on recognizing that many newcomers are not rejecting radio itself; they are looking for radio to behave like the technology world they already know.

This is where newer technology becomes a bridge rather than a replacement. Software-defined radio has already changed expectations in a major way. It has made signal visualization normal. It has made filtering, decoding, recording, and analysis easier. It has lowered the barrier for experimentation because the operator can now see, capture, manipulate, and understand signals in ways that once required expensive, specialized equipment. It has also made amateur radio feel modern in a way that resonates with people who are comfortable with computers, code, and data. In that sense, SDR is not just a new tool; it is a new way of thinking about radio.

And SDR is only part of the story. The service is also benefiting from better receivers, cleaner transmitters, improved filtering, smarter user interfaces, more stable oscillators, more efficient amplifiers, and increasingly integrated designs. The equipment available today is better in ways that matter to both newcomers and experienced operators. It is easier to configure, easier to transport, more capable in weak-signal conditions, and more flexible in operation. That progress should be celebrated, not feared. Every generation of amateur radio operators has used the best tools available to them.

We should not romanticize older limitations as though inconvenience itself were a virtue.

Looking ahead, there is every reason to expect further change. The idea of optical processing of radio signals may sound futuristic, but that is exactly the kind of development the service should be ready to embrace. Amateur radio has always existed at the edge of technical possibility. If the next breakthroughs come through photonics, advanced DSP, AI-assisted signal analysis, quantum-enhanced methods, or new hybrid systems that merge RF, optics, and computation, then amateur radio should not turn away from them just because they look unfamiliar. It should lean in. The service earns its place in the world by being a living laboratory, not a museum of past operating habits.

Let us not forget that currency of technology also plays a critical role in the ongoing support amateur radio receives from governments and regulators. Around the world, the amateur radio service is often understood as a reservoir of technically knowledgeable people who can be called upon for communications support in times of war, emergency, or natural disaster. That support is implicitly contingent on amateurs remaining relevant: able not only to use modern radio communications technology, but also to understand, adapt, and innovate at its leading edge. This is one of the reasons governments support amateur radio in the first place. They see it not only as a public service resource, but also as a source of technical skill, experimentation, and innovation.

That does not mean abandoning tradition. The charm of amateur radio lies partly in its continuity. Morse code still has value. Simple analog voice still has value. Homebuilt gear still has value. Traditional operating practices still have value. The key is not to declare one era superior to another. The key is to preserve the things that remain meaningful while making room for new entrants who come in through different doors. One operator may be drawn in by a vintage tube transmitter and another by a laptop running digital modes. Both belong. Both contribute. Both keep the service alive.

The real danger is not modernization. The real danger is gatekeeping. When any hobby becomes convinced that the only “real” way to participate is the way that was common decades ago, it begins to shrink. It starts confusing familiarity with authenticity. Amateur radio cannot afford that mindset. If it wants to remain relevant, it must be generous about how people enter, learn, and specialize. A service that covers everything from local repeater use to moonbounce, from emergency communications to software-defined experimentation, from portable QRP operation to space communications, already contains enormous variety. It should advertise that variety proudly.

This is why the original concern about amateur radio “losing its soul” deserves a balanced answer. If the soul of the service is curiosity, experimentation, self-training, technical growth, service to others, and the thrill of communicating by means you build, design, configure, or understand, then that soul is still present. But it may be expressed differently than it was in the past. The forms change. The tools change. The expectations change. The values do not have to.

A healthy future for amateur radio will be one where an older operator and a younger operator can look at the same service and see different entry points, but the same underlying promise. One sees the joy of talking across the world with a modest station. The other sees a playground for connected devices, signal processing, and software control. Another sees a path into emergency readiness. Another sees a community of tinkerers. Another sees a portable outdoor adventure. Another sees a space for lifelong learning. Amateur radio does not need to choose among those identities. Its strength is that it can hold them all.

So yes, amateur radio is far from dead. It is changing, and that change is both necessary and healthy. The service is broad enough to contain every niche, flexible enough to absorb new technology, and rich enough to keep attracting people with different motivations. If it keeps pace with younger generations, welcomes computer-integrated and software-based operation, and remains open to future developments that may someday include optical signal processing, it will continue to matter. Not because it stays frozen, but because it keeps evolving while preserving the core idea that made it remarkable in the first place.

And finally, please note my point in the January–February Communicator’s QRT column: We need to encourage others to become amateur radio chameleons to experience the full length and breadth of our interest.

~ John VE7TI

HAM LEFTOVERS...

A Hackers Guide to Circumventing Internet Shutdowns

When people are disconnected from the internet and digital services, it impacts all aspects of their life—from accessing essential information, to seeking medical care, or communicating with loved ones, both in that country and externally. See: https://www.eff.org/deeplinks/2026/05/hackers-guide-circumventing-internet-shutdowns

Alan Turing's Remarkable, Nearly-Forgotten Voice Encryption Device

Codenamed Delilah, it was in many ways an early form of digital encryption. It was secretly developed alongside his most famous wartime achievement of breaking the encryption used by the Nazis' Enigma machine. See: https://hackaday.com/2026/06/26/alan-turings-remarkable-nearly-forgotten-voice-encryption-device/

Constructing a simple 5/8-wave vertical antenna for 2 meters

From the ARRL. No loading coils, inexpensive and easy to build. See: http://www.arrl.org/files/file/Technology/tis/info/pdf/8009022.pdf

Celebrating Early Ham Gladys Kathleen Parkin, 6SO, SK, who Broke Stereotypes by Building Her own Equipment and Station

Amateur radio is no small hobby with more than three million hams setting up shacks across the globe, but, surprisingly, only 15 percent, or around 450,000, of those hams are female.One of the earliest and youngest women to get involved in the hobby, Parkin became interested in wireless telegraphy at age five, operating an amateur wireless station from her home in California for six years alongside her brother, John. It was one of the first wireless stations in California. She designed all her own instruments including a ¼-kilowatt spark-gap transmitter—no small feat. And, on April 13, 1916, at the age of fifteen, on a whim just to see if she could pass, she tested and obtained a first-class commercial radio operator's license from the United States government—earning her the call sign 6SO—and a very high test score. See: https://www.onallbands.com/celebrating-early-ham-gladys-kathleen-parkin-6so-sk-who-broke-stereotypes-by-building-her-own-equipment-and-station/

Identify That Antenna By Sight

It's a skill that radio amateurs pick up over years but which it sometimes comes as a surprise to find that is not shared by everyone, the ability to casually glance at an antenna on a mast or a rooftop and guess what it might be used for. By which of course I mean not some intuitive ability to mentally decode radio signals from thin air, but most of us can look at a given antenna and immediately glean a lot of information about its frequency and performance. See: https://hackaday.com/2022/11/01/identify-that-antenna-by-sight/

A look back...

at The Communicator—June 2016

SARC SOCIETY DIRECTORS

2025-2026

PRESIDENT
Steve Mclean VE7SXM
president at ve7sar.net

VICE PRESIDENT
Andrew Elgin VA7LGN
vicepresident at ve7sar.net

SECRETARY
Mike Porisky VE7YEG
(Contest Manager)
secretary at ve7sar.net

TREASURER
Scott Hawrelak VE7HA
treasurer at ve7sar.net

DIRECTORS

John Brodie VA7XB
Membership/Bi-weekly Bulletin
membership at ve7sar.net

Gord Kirk VA7GK
(SEPAR Liaison)
SEPAR at ve7sar.net

Doug Jeffery VA7JDJ

Scott Thomas VE7KAT

SARC COMMUNICATOR
John Schouten VE7TI
communicator at ve7sar.net
course at ve7sar.net

SARC REPEATERS
Horace Bong VA7XHB
repeater at ve7sar.net

SARC NET MANAGER
Reg Natarajan VA7ZEB
net at ve7sar.net

SARC QSL MANAGER
Shawn Dooley VA7BD

Ten years ago we took summer breaks so there was no July-August issue. Here is September 2016 Read it here

Past Communicators are available at:
Past Communicator Issues

or search the complete Communicator contents & index at:
SARCindex

July and August

We are taking a well-deserved summer break. There are no general meetings but we do have a monthly social at the OTC on the usual meeting nights. You are welcome to join us and to meet some of your fellow amateurs.

We hope to see you there and we will also be back with another Communicator and news of upcoming general meeting presenters starting in September.

SARC Monthly Meetings

2nd Wed. (Sept-Jun)
1900 hrs at the Surrey Fire Service Training Centre, 14923 - 64 Avenue, Surrey, BC.

Here is a what3words link and map: https://what3words.com/markers.addiction.ozone

Weekly SARC Social

Saturday between 0730 and 0930 hrs at the Denny's Restaurant, 6850 King George Blvd., Surrey BC

Workshops

Saturday between 1000 and Noon at the OTC 5756 142 Street, Surrey

SEPAR Net

Tuesday at 1930 hrs local

SARC Net

Tuesday at 2000 hrs local

VE7RSC Repeaters

2m North: 147.360MHz+ Tone=110.9Hz
IRLP node 1736
Echolink node 496228

2m South: 147.360MHz+ Tone=103.5Hz Fusion capable; No IRLP/EchoLink

1.2m: 223.960 Mhz -1.6 Tone=110.9Hz

70cm: 443.775MHz+ Tone= 110.9Hz
IRLP node 1737
WiRES-X Room ID 00047

On the Web

ve7sar.net

Between Communicators, watch your e-mail for news, announcements of Amateur Radio events, monthly meetings and training opportunities.

Click the links below to follow our presence on the web and social media:

SARC Blog
ve7sar.blogspot.ca

Bluesky (No more 'X')
#ve7sar.bsky.social

FaceBook
SurreyAmateurRadio

Our YouTube Channel
SurreyARC

Weekly Tuesday Evening SARC and SEPAR Nets

Join the SEPAR net every Tuesday at 7:30 pm and the SARC net at 8 pm on either of the repeaters: North repeater on 147.360 MHz +600 KHz, tone 110.9 Hz and South repeater on 147.360 MHz + 600 KHz, tone 103.5 Hz. You can also join via IRLP (node 1736) and Echolink (node 496228) which are available only on the North repeater.

Monthly 220 MHz Net

The 220 Net has moved to the last Thursday of each month at 7:30 pm on our 220 repeater at 223.960 -1.6 MHz, tone 110.9 Hz. This is not a "chat" net – just check in and exchange signal reports.

Monthly UHF Net

Darryl VA7CQD hosts a monthly UHF net held at 7:30 pm on the first Sunday of each month on SARC's UHF repeater 443.775 MHz+5 MHz tone 110.9 Hz. This is a non-chat net; just check in and carry on with your evening.

Canada's Amateur Radio Magazine
La Revue des Radioamateurs Canadiens
THE CANADIAN AMATEUR
JULY / AUGUST – JUILLET/ AOÛT 2026
The Sudbury Amateur Radio Club Tries A New Direction
VY0IRC: A New Presence in The North | Elgin Amateur Radio Society Winter Exercise
SMART 2026 | Canada-Wide Science Fair
Publications Mail Agreement # 40038688 Registration # 09866

The Canadian Amateur (TCA),

Canada's premiere national magazine devoted to Amateur Radio, is published six times per year and is the membership journal of the Radio Amateurs of Canada (RAC). It is available in both print and digital versions (eTCA). Members of RAC, Canada's sole national Amateur Radio organization, receive TCA automatically.

A subscription to TCA also provides membership in Radio Amateurs of Canada. RAC is also the publisher of TCA. For information on how to join Radio Amateurs of Canada and subscribe to TCA please visit our Membership Sign Up page.

At 64-pages per issue and reaching approximately 4,500 readers, TCA offers news and views on the Canadian Amateur Radio scene from coast to coast to coast. It includes regular columns, features and technical articles of interest to Amateur Radio operators. In addition, a Coming Events calendar, Feedback, QSL Bureau information and coverage of regulatory issues are also provided.

If you would like additional information about The Canadian Amateur magazine please contact the Editor Alan Griffin at tcamag@yahoo.ca.

HF/50/(70) MHz TRANSCEIVER

IC-7300MK2

Even More Excitement